NATIONAL INSTITUTE OF SIDDHA

Tambaram sanatorium, Chennai – 47

Affiliated to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI - 600 032

A STUDY ON

AAN MALADU

(DISSERTATION SUBJECT)

For the partial fulfillment of the requirements to the Degree of

DOCTOR OF MEDICINE (SIDDHA)

BRANCH - I - MARUTHUVAM

SEPTEMBER - 2007

CERTIFICATE

Certified that I have gone through the dissertation submitted by Dr.R.SENTHILKUMARAN a student of final MD(S) Branch-I, Department of Maruthuvam, National Institute of Siddha, Tambaram Sanatorium, Chennai-47 and the dissertation work, a study on Aan maladu has been carried out by individual only. This dissertation does not represent or reproduce the dissertation submitted and approved earlier.

Place: Tambaram Sanatorium, Chennai-47

Date:

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INTRODUCTION

The term “Maruthuvam” is derived from the word “Marundhu” to denote the practice of medicine. The word Maruthuvam has the following connotations.

1. Curative
2. Antidote
3. Management
4. Medical practice
5. Treatment

Components of medicine

The state of happiness is one which is free from suffering. Suffering may be due to internal or external factors. Prevention, cure and contentment are the three components of medical science which are the means for healthy and happy living.

Man develops three distinct, personalities namely the mind, the vital or life force and the body. Through the mind he thinks and wills; through the life force he executes his thought and will; through the physical body he expresses what he thinks and wills. The mind is vatham, life force is pitham and the body is kapham. The mind and life force are hidden in the gross physical body and evolve gradually

Man has gross physical body and subtle physical body. The subtle physical body is immediately behind the gross physical body and is closely connected with it. The life force which is different from material energy derived from food pervades the gross physical through the subtle physical. The life force is the basis for man’s mental and spiritual activities on that nature may evolve him towards the perfection. In sickness and depressed or disturbed mental conditions the life force is priority affected.

According to Thiruvalluvar,

“ÌÆÄ¢É¢ ¾¢Â¡Æ¢É¢ ¦¾ýÀ ¾õÁì¸û
ÁÆ¨Äî ¦º¡ø §¸Ç¡¾Å÷”.

The pipe is sweet, the lute is sweet," say those who have not heard the prattle of their own children.

“¦ÀÚÁÅüÚû Â¡ÁÈ¢Å ¾¢ø¨Ä ÂÈ¢ÅÈ¢ó¾
Áì¸ð§À ÈøÄ À¢È”.

Among all the benefits that may be acquired, we know no greater benefit than the acquisition of intelligent children.

Infertility is a reproductive health problem that affects many couples in the human population. About 13–18% of couple suffers from it and approximately one-half of all cases can be traced to either partner. The affected couples suffer from enormous emotional and psychological trauma and it can constitute a major life crisis in the social context. Many cases of idiopathic infertility have a genetic or molecular basis.

The recent growth of the Indian population has been unprecedented. It stands currently at over one billion and is expected to touch 2 billion by 2035 (assuming an average growth rate of 2%). Even though curtailing population growth is a major national concern, a substantial number of infertile couples in the Indian population have an equally great concern, that of having a child.

Approximately 15% of couples attempting their first pregnancy meet with failure. Most authorities define these patients as primarily infertile if they have been unable to achieve a pregnancy after one year of unprotected intercourse. Conception normally is achieved within twelve months in 80-85% of couples who use no contraceptive measures, and persons presenting after this time should therefore be regarded as possibly infertile and should be evaluated.

AIM AND OBJECTIVES

The need for the study is to create awareness about the male sexual problem especially male infertility.

Aim

To increase the sperm count in male infertility patients.

To increase the sperm motility in male infertility patients.

Objectives

To collect various aspects of Siddha and Modern literatures.

To conduct clinical trial in male infertility patients.

To evaluate the efficacy of the Murungaipoo lehyam

To evaluate the chemical analysis of the Murungaipoo lehyam

To find out side - effects of the drug, if any.

¬ñ ÁÄÎ

“À¡÷ì¸§Å ¬ñÁ¸É¢ý Å¢óÐ¾¡Ûõ
À¾Á¡É ¾¢ò¾¢ôÒÂ¢ø Ä¡¾¾¡Öõ
²ü¸§Å ºÄÁ£¾¢ø Á¢¾ó¾¾¡Öõ
±Æ¢Ä¡¸ ×Â¢÷ôÀüÚ Â¢ÕôÀ¾¡Öõ
§º÷ì¸§Å ãò¾¢Ãò¾¢ø Ñ¨Ã¾¡ý §À¡Öõ
¦ºÂÄ¡É ¸ÕÅÐ×õ ¾Ã¢ì¸Á¡ð¼¡
¾£÷ì¸§Å ä¸¢ÓÉ¢ º¢¸¢îº¡Ãõ
¦¾Ç¢Å¡¸ô À¡Ê ¨Åò¾¡÷ ¾¢ÈÁ¢¾¡§É”.
-ä¸¢ÓÉ¢

Meaning of the above text

Lack of sweetness

Buoyancy on water

Absence of virility

Frothy micturition

¬ñÁÄÎ

¬ñÀ¢û¨ÇìÌ þÂü¨¸Â¡¸§Å «¨Áó¾ ÁÄðÎò¾ý¨Á. þ¾É¡ø «Å÷¸Ç¢ý Å¢óÐ ¾¢ò¾¢ôÀ¢øÄ¡Áø ¾ñ½£Ã¢ø Å¢ð¼¡ø ¸¨ÃóÐ Á¢¾ôÀÐõ, ¯Â¢÷ôÀüÈÐõ, ãò¾¢Ãò¾¢ø Ñ¨Ã ¸ðÎÅÐÁ¡¸ þÕìÌõ. þùÅ¢óÐÅ¢É¡ø ¸÷ôÀõ ¾Ã¢ì¸ ÓÊÂ¡Ð.

The semen in such cases will be devoid of sweetness and life and will float on the surface of water. The urine also will be frothy. Such man will be incapable to impregnate women.

Å¢óÐüÀÉõ (Å¢óÐÅ¢ý §¾¡üÈõ)

“¯¾Âò¾¢ø Å¢óÐÅ¢ø µíÌ Ìñ¼Ä¢Ôõ
¯¾Â ÌÊÄ¢ø ÅÂ¢ó¾Åõ ´ýÀ¡ý
Å¢¾¢Â¢ø À¢ÃÁ¡¾¢ ¸ûÁ¢Ì ºò¾¢
¸¾¢Â¢ü ¸Ã½í ¸¨Ä¨Å ¸Ã¢§Â!”

-¾¢ÕãÄ÷.

º¢Õ‰Ê ¸¡Äò¾¢ø Å¢óÐÅ¢ø Ìñ¼Ä¢ §¾¡ýÈ¢ Å¢ÇíÌ¸¢ÈÐ. §¾¡ýÚÅ¾üÌ þ¼Á¡¸¢Â ÀÃÁ ¬¸¡Âò¾¢ø ÅÂ¢ó¾Åõ ´ýÀÐõ,À¢ÃÁý Ó¾Ä¡É ´ýÀÐ §À¾í¸Ùõ «ÅüÈ¢ý ºò¾¢¸Ùõ þò¾òÐÅí¸Ç¢ý ¿¨¼Â¡ø «ó¾¸Ã½í¸û, Àïº¸¨Ä¸û, ¨ÅÃ¢Â¡¾¢ Å¡ìÌ¸û þ¨Å «¨ÉòÐõ Å¢Ã¢Ôõ. º¢Õ‰Ê ¸¡Äò¾¢ø Å¢óÐ ±ýÀÐ ÀÃº¢Åò¾¢ý ¸¢Ã¢Â¡ºì¾¢Â¢ý ¸¡Ã¢ÂôÀ¡ð¼¡ø ¦ÅÇ¢ôÀÎ¸¢ÈÐ. Ìñ¼Ä¢ ±ýÀÐ ÀÃº¢Åò¾¢ý »¡Éºì¾¢Â¢ý ¸¡Ã¢ÂôÀ¡ð¼¡ø ¦ÅÇ¢ôÀÎ¸¢ÈÐ.

“«Æ¢¸¢ýÈ Å¢óÐ «Ç¨Å «È¢Â¡÷
¸Æ¢¸¢ýÈ ¾ý¨ÉÔð ¸¡ì¸Öó §¾Ã¡÷
«Æ¢¸¢ýÈ ¸¡Âò ¾Æ¢ó¾Â÷ ×ü§È¡÷
«Æ¢¸¢ýÈ ¾ý¨Á ÂÈ¢ó¦¾¡Æ¢ Â¡§Ã!”

-¾¢ÕãÄ÷.

«Æ¢¸¢ýÈ ¦Åñ½£Ã¡¸¢Â Å¢óÐÅ¢ý «Ç¨Å ÜÚí¸¡ø ±ñÀÐ ÐÇ¢ ¦ºó¿£÷ ´Õ ¦Åñ½£Ã¢ý ÐÇ¢Â¡Ìõ. þò¾¨¸Â ±ñÀÐ ¦Åñ½£Ã¢ý ÐÇ¢§Â ´Õ ÓØòÐÇ¢ Å¢óÐÅ¡Ìõ. ±É§Å ´Õ ÐÇ¢ Å¢óÐ «Æ¢Â¢ý ¬È¡Â¢ÃòÐ ¿¡ëÚ ÐÇ¢ ¦ºó¿£÷ «Æ¢ó¾¾¡Ìõ. ¬Â¢Ãõ ¦º¡ðÎ ÌÕ¾¢Ôõ, ãÅ¡Â¢Ãõ ¦º¡ðÎ Ãò¾Óõ, Íì¸¢ÄÓõ ÍñÊì¸Äó¾§¾ ´Õ ¦º¡ðÎ Å¢ó¾¡õ.

Å¢óÐ ƒÂõ (§À¡¸ ºÃ§Å¡ð¼õ)

Å¢óÐ ¦ÅÇ¢ôÀ¼¡Ð «¼ìÌõ Ó¨È¨ÁÔõ §À¡¸¸¡ÄòÐ À¢Ã¡½Å¡ÔÅ¢ý µð¼ò¾¡ø Å¢óÐ¨Å Á¢Ì¾¢Â¡¸ ¦ÅÇ¢ôÀ¼¡¾Åñ½õ «¼ìÌõ ¯À¡ÂÓõ ¬Ìõ. Å¢óÐ À¢ñ¼ ¯üÀò¾¢üÌ ¯Ã¢Â¾¡Ìõ. þÐ ¯¼Ä¢ý «¸ÃÁ¡ö º¢Å§Â¡¸ò¾¢ý Ó¾üÀÊÂ¡ö þÕò¾Ä¢ý þ¾¨É «¼ìÌ¾ø þýÈ¢Â¨ÁÂ¡¾Ð.

Å¢óÐ¨Åô ÀüÈ¢Â Å¢Çì¸õ

“Å¢óÐ¿¢¨Ä ÂÈ¢óÐ×óÐ À¡Ôí ¸¡ÄõÅ¾¡ó¾ ¿¡¾ÁÐìÌ Â¢Õñ¼¡¸¢¦º¡ó¾Ó¼ §ÉÂ¢ÃñÎÁ ½¢ÔÁ¡¸¢îÅó¾Á¾¢ô À¢¨ÈÂÐ×õ Åð¼Á¡¸¢Åð¼Á¾¢ ÃñÎÕÅ¡ö ÁñÏÁ¡¸¢«ó¾ÓûÇ ÁñÏ¾È¢ ¯ôÀ¡ö ¿¢ý§È Â¡¾¢¦ÂýÈ ¦À¡ÕÇ¡É À¢ñ¼Á¡î§º”.

-«¸ò¾¢Â÷.

Å¢óÐ À¡Ôí¸¡ÄõÅ¢ý¿¡¾òÐìÌ ¯Â¢Õñ¼¡¸¢«ùÅ¢ÃñÎõ §º÷óÐ Á½¢ÔÁ¡¸¢, «ó¾ §º¡¾¢Á½¢, Ó¾Ä¢ø À¢¨È§À¡ø ¬¸¢À¢ýÒ, «ôÀ¢¨ÈÂ¡ÉÐ Åð¼Á¡¸¢ «Ð ¾¢ÃñÎ ÁñÏÁ¡¸¢ ¿¢üÌõ. Áñ¨½ ¯¾È¢ ¯ôÀ¡ö ¿¢üÌõ «ó¾ ¬¾¢Â¡É ¦À¡Õû À¢ñ¼Á¡îÍ.

After the penetration of the sperm in to the ovum, the sperm head fuse with the oocyte to form single cell. Then it undergoes several stages of cell division and finally form the embryo.

Íì¸¢Ä Ì½õ

“¯ñ¨ÁÂ¡É Íì¸¢Ä ÓÀ¡ÂÁ¡ Á¢Õó¾Ðõ ¦Åñ¨ÁÂ¡¸¢ ¿£Ã¢§Ä Å¢¨ÃóÐ¿£Ã ¾¡ÉÐõ ¾ñ¨ÁÂ¡É ¸¡Â§Á ¾Ã¢òÐÕÅ Á¡ÉÐõ ¦¾ñ¨ÁÂ¡É »¡É¢¸û ¦¾Ç¢óÐ¨Ãì¸ §ÅÏ§Á”.

Å¢óÐÅ¡ÉÐ ¾¡Â¢ý ¸÷ôÀò¾¢ø ¦ÅÌ¾ó¾¢ÃÁ¡¸î ¦ºøÖ¸¢ýÈÐ ±ýÀ¡÷. «í¹Éõ ÒÌõ§À¡Ð ±øÄ¡õ ¿£Ã¡¸ Å¢¨¼Â¢Ä¢ÕìÌõ ¿£Ã¢ø ¸ÄóÐ ´Õ ÀÉ¢òÐÇ¢ÂÇ§Å ¿¢¨Äò¾¢ÕìÌõ ±ýÀ¡÷.«ó¾ º¢È¢Â «Ç§Å ¦ÀÃ¢Â åÀÁ¡ö ÀÃ¢½Á¢ì¸¢ýÈÐ ±ýÀ¡÷. þùÅÃ¢Â ¦ÀÃ¢Â Å¢„Âõ »¡É¢¸Ùì§¸ ÒÄôÀÎÅ¾¡Ìõ.

At the time of copulation, the semen is ejaculated. The prostatic fluid gives the semen a milky appearance. In the early minutes after ejaculation, the sperm remains immotile, possibly because of the viscosity of the coagulum. As the coagulum dissolves the sperm become highly motile.

Íì¸¢Äò¾ý¨Á

1. ¦Åñ¨ÁÔõ, ¦Åñ¦½öìÌ ¿¢¸Ã¡ÔÁ¢ÕôÀ¢ý ¯ò¾Áò¾¢ø ¯ò¾Áõ.
2. ¦Åñ¨ÁÔõ ¾Â¢ÕìÌ ¿¢¸Ã¡ÔÁ¢ÕôÀ¢ý ¯ò¾Áò¾¢ø þÃñ¼¡ó¾Ã ¯ò¾Áõ.
3. ¦Åñ¨ÁÔõ À¡ÖìÌ ´ôÀ¡¸×Á¢ÕôÀ¢ý Áò¾¢Áò¾¢ø ¯ò¾Áõ.
4. ¦Åñ¨ÁÔõ §Á¡ÕìÌ ´ôÀ¡¸×Á¢ÕôÀ¢ý Áò¾¢Áò¾¢ø Áò¾¢Áõ.
5. §¾¨ÉÔõ «¾ý ¿¢Èò¨¾Ôõ ¸Éò¨¾Ôõ ´ò¾¢Õó¾¡ø «¾Áò¾¢ø ¯ò¾Áõ.
6. ¦¿ö¨ÂÔõ «¾ý ¿¢Èò¨¾Ôõ ¸Éò¨¾Ôõ ´ò¾¢Õó¾¡ø «¾Áò¾¢ø Áò¾¢Áõ.
7. ¸û¨Çô §À¡ýÈ ¿¢ÈÓõ ¾ÊôÒÁ¢ÕôÀ¢ý «¾§Á¡«¾Áò¾¢ø ¯ò¾Áõ.
8. ¾ñ½£¨Ãô §À¡Ä¢ÕôÀ¢ý º¡Ãõ Ó¾Ä¢Â ¯¼ü¾¡Ðì¸Ç¢Öõ ºüÚõ º¡ÃÁüÈÅ¦ÉýÚõ, ¯Â¢Õ¼ý þÕó¾¡Öõ À¢½òÐìÌ ´ôÀ¡ÉÅ¦ÉýÚõ §¾¨ÃÂ÷ ÂÁ¸õ ÜÚ¸¢ÈÐ.

If the semen is,

1. White and akin to the butter, it is excellent.
2. White and curd, it is very good.

3. White and akin to the milk, it is good.
4. White and akin to the buttermilk, it is fair.
5. Akin to the honey in colour and consistency, it is average.
6. Akin to the ghee in colour and weight, it is poor.
7. Akin to the toddy in colour a thickness it is very poor.
8. Akin to the water, it is very bad.

“¯ýÉ¢Â ¸÷ôÀì ÌÆ¢Â¡õ ¦ÅÇ¢Â¢§Ä
ÀýÉ¢Â ¿¡¾õ À¸÷ó¾ À¢ÕòÅ¢
ÅýÉ¢Ôõ Å¡Ô× Á¡ÔÕï Íì¸¢Äõ
ÁýÉ¢Â ºÁÉ¡ö ÅÇ÷ìÌ Ó¾¸§Á.”

- ¾¢ÕãÄ÷.

The ovum consists of the element earth, whereas the sperm consists of fire and air. The uterine wall which nourishes it has water and the uterine cavity is of the element space. Therefore in the formation of fetus all the five elements combine and create it.

“Å¢Øó¾Ð þÄ¢í¸õ Å¢Ã¢ó¾Ð §Â¡É¢
´Æ¢ó¾ Ó¾ø ³óÐõ ®¨Ãó§¾¡Î ²È¢ô
¦À¡Æ¢ó¾ ÒÉøâ¾õ §À¡üÚõ ¸Ã½õ
´Æ¢ó¾ Ñ¾ø¯îº¢ ¯û§Ç ´Ç¢ò¾§¾!”

-¾¢ÕãÄ÷.

“¬ñÁ¢¸¢ø ¬ñ¬Ìõ ¦ÀñÁ¢¸¢ø ¦Àñ¬Ìõ
âñþÃñ ¦¼¡òÐô ¦À¡Õó¾¢ø «Ä¢¬Ìõ
¾¡ñÁ¢Ìõ ¬¸¢ø ¾Ã½¢ ÓØ¾¡Ùõ
À¡½Å Á¢ì¸¢Êø À¡öó¾Ðõ þø¨Ä§Â”.

- ¾¢ÕãÄ÷.

At the time of copulation if the male dominates then it is male & if the female dominates then it is a female. If the male and the female are equal then the child will be neutral gender or an eunuch. Here male indicates the vindhu and the female indicates nadham.

“§Å÷ì¸ §Å §ÅÄ¢§À¡ø Å¨ÇóÐ ¸¡ìÌõ
Å¢óÐ×¼ý À¢Ã¡½Å¡Ô Å¢Çì¸Ä¡§Á”

-ä¸¢ÓÉ¢

Abana stays outside and the prana goes along with spermatozoa and bisects the size of the zygote.

“Å¢óÐ ÌÊÂ¢Õó¾ ¾¢Õ¿¡ð¨¼ Å¢ð§¼ý
Á¡Ú¸¢ýÈ ¸ò¾¢Ã¢ì§¸¡ø Àð¼ó¾É¢ø
Å¢óÐ¿¢ýÚ Å¢ÇíÌ¿¾¢ ¨ÁÂòÐû§Ç
Å¢ÇíÌ ÍÅ¡¾¢ð¼¡É ¦ÅÇ¢Â¢§Ä¾¡ý”.

-¾¢ÕÅûÙÅ÷ »¡É¦ÅðÊÂ¡ý

The swadhittanam is to be found between the genital and navel region. The swadhittanam is correlated with adrenal gland which secretes testosterone.

Íì¸¢Ä Å¡¾õ

Å¡¾Á¡ Ó¼ÖÕ¸¢ Á¢¸×õ ÅüÈ¢
ÁÄãò¾¢Ãï º¢ì¸¢§Â ¸£úÅ¢Æ¡Áø
¿¡¾Á¡õ ¿¡ì§¸¡Î ãìÌ¾ýÉ¢ø
¿Ïì¸Á¡ Ô¾¢Ãó¾¡ ÉÕÅ¢ À¡Ôï
§º¾Á¡öî §ºðÎÁÓí §¸¡¨Æ Ôñ¼¡ï
¦ºÂ§Ä¡Î ÍÅ¡ºÁ¡ ÂÕº¢ Ôñ¼¡ï
Ý¾Á¡öî Íì¸¢Äó¾¡ý ÚýÉ¢ Â¡Ìó
ÐÃ¢ÂÍì ¸¢ÄÅ¡¾ Ýðºó ¾¡§É.

Emaciation, constipation, oliguria, bleeding from the nose, phlegm accumulation due to increased kapham, breathlessness, loss of taste. All the symptoms are associated with affected sukkilam.

SEVEN PHYSICAL CONSTITUTIONS

Natural characters

1. Saarum (chyle)

This gives mental and physical perseverance.

2. Senneer (blood)

Imparts colour to the body, nourishes the body and is responsible for the ability and intellect of an individual

3. Oon (muscle)

It gives shape to the body according to the physical activity and covers the bone.

4. Kozhuppu (adipose tissue)

It lubricates the joints and other parts of the body to function smoothly

5. Enbu (bone)

Supports the frame and responsible for the postures and movements of the body.

6. Moolai (bone marrow)

It occupies the medulla of the bones and gives strength and softness to them.

7. Sukkilam (sperm)

It is responsible for reproduction.

MALE INFERTILITY

Infertility is defined as the inability of a couple to initiate a pregnancy after 12 months of unprotected intercourse. Approximately one third of cases result from male factors, one third from female factors & one third from male - female factors.

Primary infertility

Infertility in a patient who has never conceived

Secondary infertility

Infertility in a patient who has previously conceived

Premature ejaculation

It depends on the timing or speed of the partner's response and whether satisfactory intercourse has been achieved. Persistent or recurrent ejaculation with minimal sexual stimulation or before, upon or shortly after penetration and before the person wishes it.

Etiology

(1) Deficient sperm production

(2) Ductal obstruction

(a) Congenital defects

(b) Post infectious obstruction

(c) Cystic fibrosis

(d) Vasectomy

(3) Ejaculatory dysfunction

(a) Premature ejaculation

(b) Retrograde ejaculation

(4) Disorders of accessory glands

(a) Infections

(b) Inflammation

(5) Coital disorders

(a) Erectile dysfunction

(6) Increased scrotal temperature

(a) Tight fitting clothes and briefs

(b) Varicocele

(7) Environmental causes

(a) Increased pollution

(b) Organic solvents

(c) Pesticides (DDT, DBCP)

(d) Heavy metals (lead, mercury, arsenic)

(8) Dietary causes

(a) Increased saturated diets

(b) Reduced intake of fruits, vegetables and whole grains

(c) Reduced intake of dietary fiber

(d) Increased exposure to synthetic estrogens

(9) Exposure to radiation

(10) Overuse of alcohol, tobacco or marijuana

(11) Acquired defects

(a) Orchitis

(b) Mumps and other viruses

(c) HIV

(12) Congenital disorders

(a) Chromosome disorders

(b) klinfelter's and related syndrome

(e.g.) XXY, XXY/XY, XYY, XX

(c) Testosterone biosynthetic enzyme defects

(d) Myotonia dystrophy

(13) Asthenozoospermia

Reduced velocity or vigour of sperm motility may be due to metabolic / functional defects or ultra structural malformations in the axonemal complex of the sperm tail usually associated with oligoszoospermia or a high percentage of dead and abnormally shaped sperm. Testicular spermatozoa are normal, the defects occurring during epididymal transit. Absence of the central pair of

microtubules in the sperm tail is an even rarer cause of complete asthenozoospermia.

(14) Teratoszoospermia

An extreme of abnormal sperm morphology is the failure of acrosome cap development in the sperm head leading to formation of round headed spermatozoa which are unable to bind to the zona pellucida of ova, a prerequisite for fertilization.

(15) Defects in target tissue

Mutation in the ligand binding or DNA binding domains of the androgen receptor cause defects in androgen action and varying degrees of failure of masculinization during primary sexual development.

(16) Sperm autoimmunity

Immunological infertility is a specific disorder caused by sperm membrane bound IgA antibodies found in around 5 percent of men precenting with infertility. Conditions predisposing to sperm autoimmunity include vasectomy, testicular injury / inflammation, genital tract infection/ obstruction, and family history of auto immune disease. Male patient with significant antisperm antibody titres usually have severely suppressed fertility potential due to sperm agglutination, poor sperm transit through cervical mucus, and blocked sperm oocyte fusion.

(17) Drugs

(a) Cytotoxic agents

(b) Inhibitors of testosterone synthesis and antiandrogens

(18) Hypogonodotropic hypogonadism

(A) Idiopathic or congenital

(a) Isolated deficiency of GnRH with anosmia (kallman's syndrome)

(b) Pituitary hypoplasia

(B) Acquired

(a) Trauma, post surgery

(b) Neoplastic

(c) Pituitary adenomas

ANATOMY OF MALE REPRODUCTIVE ORGANS

TESTES

The testes are the primary reproductive organs or gonads in the male. They are ovoid reproductive and endocrine organs responsible for sperm production. They are suspended in the scrotum by scrotal tissues including the dartos muscle and the spermatic cords. Average testicular dimensions are 4-5 cm in length, 2.5 cm in breadth and 3cm in anterio posterior diameter; their weight varies from 10.5- 14g. The left testis usually lies lower than the right testis. Each testis lies obliquely within the scrotum, its upper pole tilted anterolaterally and the lower posteromedially.

The testis is invested by three coats;

Tunica vaginalis

Tunica albuginea

Tunica vasculosa

Tunica vaginalis

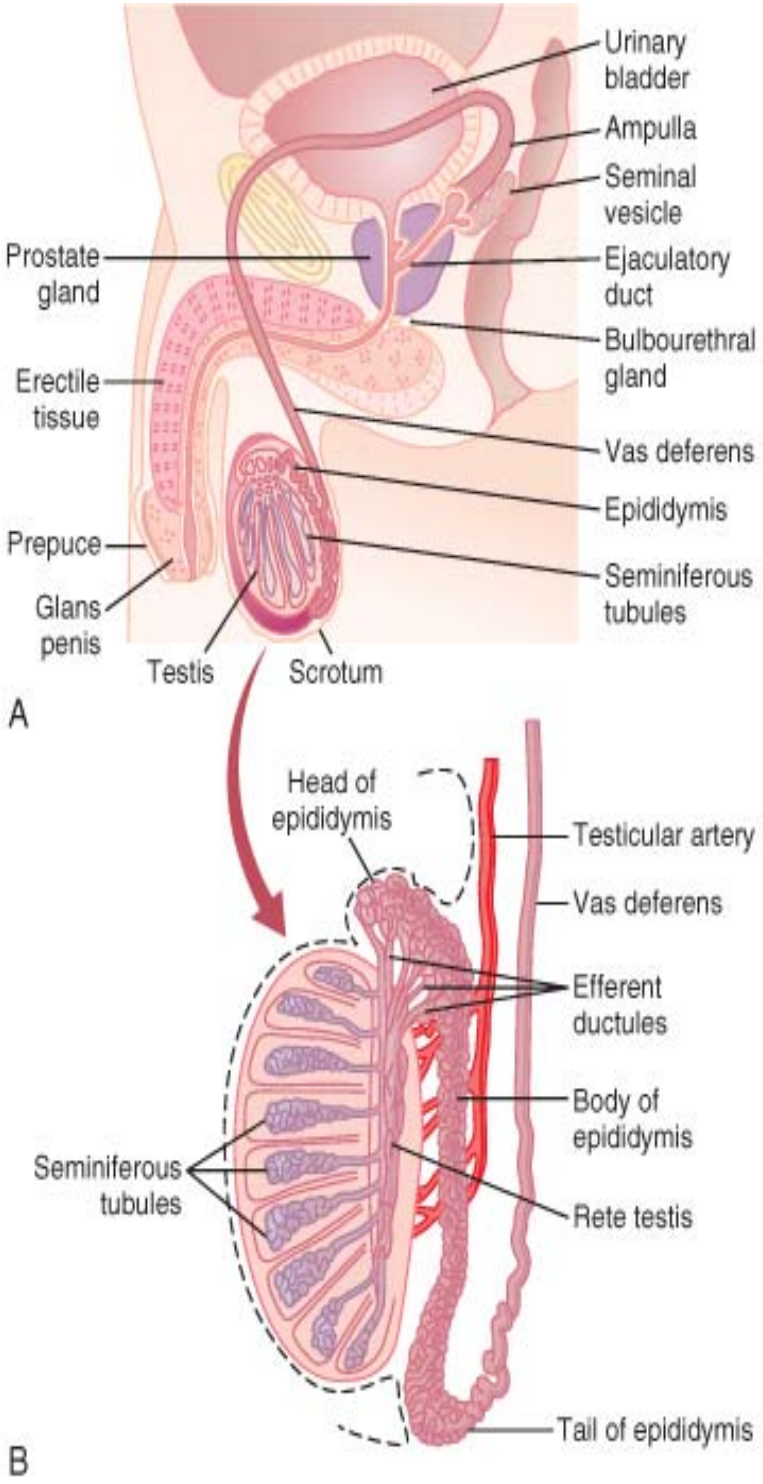
It is the lower end of the peritoneal processus vaginalis, whose formation proceeds the decent of the fetal testis from the abdomen to the scrotum. The visceral layer covers all the aspect of the testis except most of the posterior aspect. The more extensive parietal layer reaches below the testis and ascends in front of and medial to the spermatic cord.

Tunica albuginea

It is a dense, bluish white covering for the testis. It is composed mainly of interlacing bundles of collagen fibres. It is covered externally by the visceral layer of the tunica vaginalis, except at the epididymal head and tail and the posterior aspect of the testis, where vessels and nerves enter. It covers the tunica vasculosa and, at the posterior borders of the testis, project in to the testicular interior as a thick, incomplete fibrous septum, the mediastinum testis.

A. MALE REPRODUCTIVE SYSTEM

B. INTERNAL STRUCTURE OF THE TESTIS



Tunica vasculosa

It contains a plexus of blood vessels and delicate loose connective tissue, and extend over the internal aspect of the tunica albuginea, covering the septa and therefore all the testicular lobules.

Epididymis

The epididymis lies posteriorly and slight lateral to the testis, with vas deferens along its medial side. It has an expanded head superiorly, a body and a tail. Its over all length is 6-7 cm and it consists of the single convoluted ductus epididymis formed by the union of the efferent ducts of the testis, which attach to the rete testis. From the tail the vas deferens ascends medially to the deep inguinal ring, within the spermatic cord.

Testicular torsion

The testis and epididymis are usually fixed to their surrounding tissues. In some patients this fixation may be insufficient, a condition which allows the structures to twist within the tunica vaginalis. This is termed testicular torsion and normally results in severe scrotal pain. Fertility may be affected by an episode of torsion.

Seminal vesicles

The two seminal vesicles are sacculated, contorted tubes located between the bladder and rectum. Each vesicle is 5 cm long, somewhat pyramidal, the base being directed up and posterolaterally. Essentially the seminal vesicle is a single coiled tube with irregular diverticula. The coils and the diverticula are connected by the fibrous tissue. The diameter of the tube is 3-4 mm and its uncoiled length is 10-15cm.

Vas deferens

It is a muscular tube, 45 cm long, which conveys sperm to the ejaculatory ducts, and its distal continuation of the epididymis, starting at the epididymal tail. At first it is very tortuous, but it becomes straighter, and ascends along the posterior aspect of the testis. From the superior pole of the

testis it ascends in the posterior part of the spermatic cord, and traverses the inguinal canal. At the internal inguinal ring the vas deferens leaves the cord, curves round the lateral side of the inferior epigastric artery. It then turns back and inclines slightly down and obliquely across the external iliac vessels to enter the lesser pelvis. It crosses the ureter and bends acutely to pass anteromedially between the posterior surface of the bladder and upper pole of the seminal vesicle. It finally descends to the base of the prostate, where it joins to the duct of the seminal vesicle at an acute angle to form the ejaculatory duct.

Ejaculatory ducts

The ejaculatory ducts are formed on each side by the union of the duct of the seminal vesicle with ampulla of the vas. Each is almost 2 cm in length, starts from the base of the prostate, runs anteroinferiorly between its median right or left lobes.

Spermatic cord

At the testis traverse the abdominal wall into the scrotum during early life, it carries its vessels, nerves and vas deferens with it. These meet at the deep inguinal ring to form the spermatic cord, which suspends the testis in the scrotum and extends from the deep inguinal ring to the posterior aspect of the testis. The left cord is a little longer than the right. Between the superficial ring and testis the cord is anterior to the rounded tendon of adductor longus.

The spermatic cord contains the vas deferens, testicular artery and veins, cremastric artery and artery to the vas deferens, genital branches of the genitofemoral nerve, cremastric nerve and sympathetic components of the testicular plexus.

Scrotum

The scrotum is a cutaneous fibro muscular sac containing the testes and lower parts of the spermatic cords. It hangs below the pubic symphysis between the anteromedial aspects of the thighs. It is divided in to right and left

halves by a cutaneous raphe, which continues ventrally to the inferior penile surface and dorsally along the midline of the perineum to the anus.

It consists of skin, dartos muscle and external spermatic, cremastric and internal spermatic fasciae. The scrotal skin is thin, pigmented and often rugose. It bears thinly scattered, crisp hairs. It has sebaceous glands, numerous sweat glands, pigment cells and nerve endings.

PENIS

The penis, the male copulatory organ, consists of an attached root in the perineum and a free, normally pendulous body which is completely enveloped in skin. The penile skin is remarkably thin, dark and loosely connected to the tunica albuginea. At the corona of the penis it is folded to form the prepuce or foreskins, which variably overlap the glans.

Root

The root of the penis consists of three masses of erectile tissue in the urogenital triangle, namely the two crura and the bulb, firmly attached to the pubic arch and the perineal membrane respectively. The crura are the posterior regions of the corpora, and the bulb is the posterior and of the corpus spongiosum.

Body

The body of the penis contains three elongated erectile masses, capable of considering enlargement when engorged with blood during erection. When flaccid the penis is cylindrical, but when erect it is triangular with rounded angles.

Corpora cavernosa

The corpora cavernosa of the penis form most of the body. On the urethral surface their combined mass has a wide median groove, adjoining the corpus spongiosum.

Corpus spongiosum

The corpus spongiosum of the penis is traversed by the urethra. Near the end of the penis it expands in to a somewhat conical enlargement, the glans penis.

REPRODUCTIVE AND HORMONAL FUNCTIONS OF THE MALE

The reproductive functions of the male can be divided in to three major subdivisions:

(1) Spermatogenesis

(2) Performance of male sexual act

(3) Regulation of male reproductive functions by various hormones

Spermatogenesis

During formation of the embryo, the primordial germ cells migrate in the testes and become immature germ cells called spermatogonia which lie in two or three layers of the inner surfaces of the seminiferous tubules. The spermatogonia begin to undergo mitotic division beginning at puberty, and continually proliferate and differentiate through definite stages of development to form sperm.

Steps of spermatogenesis

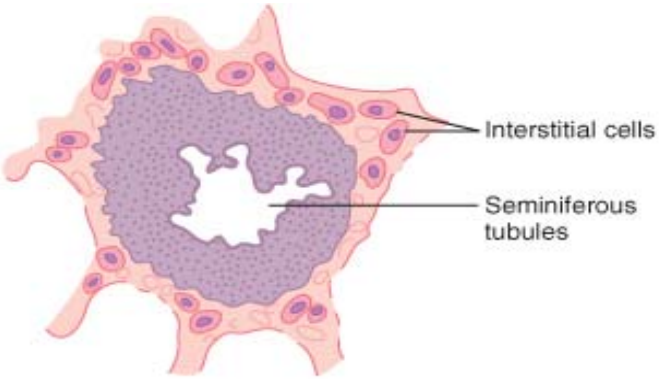
Spermatogenesis occurs in the seminiferous tubules during active sexual life as the result of stimulation by anterior pituitary gonadotropic hormones beginning at an average age of 13 years and continuing throughout most of the remainder of life but decreasing markedly in old age.

In the first stage of spermatogenesis, the spermatogonia migrate among sertoli cells toward the central lumen of the seminiferous tubule. The sertoli cells are very large with overflowing cytoplasmic envelopes that surround the developing spermatogonia all the way to the central lumen of the tubule.

Meiosis

Spermatogonia that cross the barrier in to the sertoli cell layer become progressively modified and enlarged to form large primary spermatocytes. Each of these undergoes meiotic division to form two secondary spermatocytes. After another few days these too divide to form spermatids that are eventually modified to become spermatozoa (sperm).

CROSS SECTION OF A SEMINIFEROUS TUBULE



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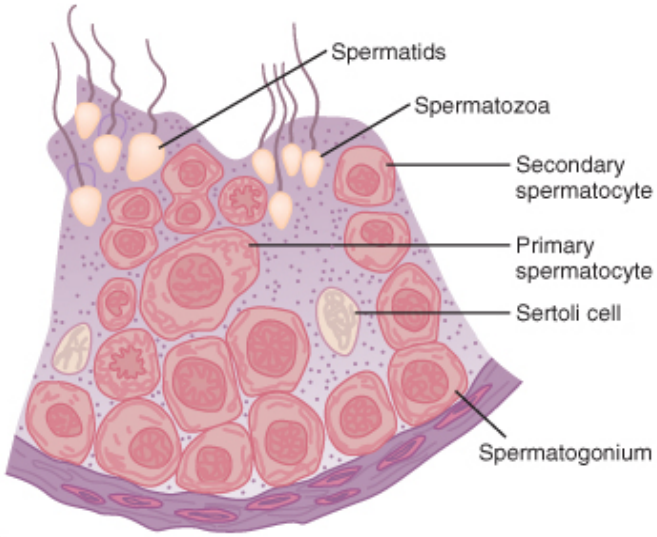
STAGES IN THE DEVELOPMENT OF SPERM FROM SPERMATOGONIA

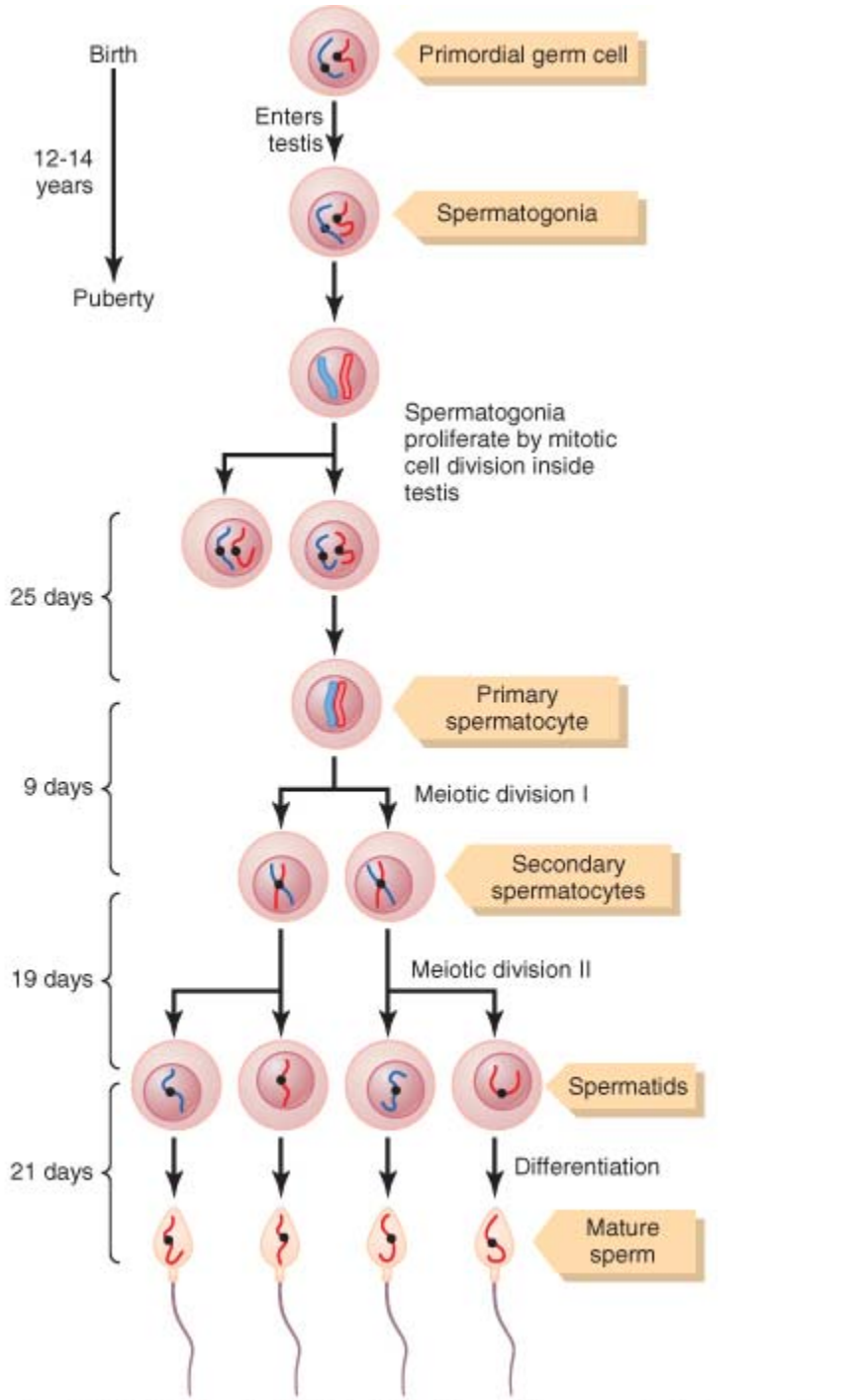


B

During the change from the spermatocyte stage to the spermatid stage, the 46 chromosomes (23 pairs of chromosomes) of the spermatocyte are divided, so that 23 chromosomes go to one spermatid and the other 23 to the second spermatid. This also divides the chromosomal genes so that only one half of the genetic characteristics of the eventual fetus are provided by the father, while the other half are derived from the oocyte provided from the mother.

The entire period of spermatogenesis from spermatogonia to spermatozoa, takes about 74 days.

CELL DIVISIONS DURING SPERMATOGENESIS



In each spermatogonium, one of the 23 pairs of chromosomes carries the genetic information that determines the sex of each eventual offspring.This pair is composed of one x chromosomes, which is called the female chromosome, and one Y chromosome, the male chromosome. During meiotic division, the male Y chromosome goes to one spermatid that then becomes a male sperm, and the female X chromosome goes to another spermatid that becomes a female sperm. The sex of the eventual offspring is determined by which of these two types of sperm fertilizes the ovum.

Formation of sperm

When the spermatids are first formed, they still have the usual characteristics of epitheliod cells, but soon they begin to differentiate and elongate in to spermatozoa. Each spermatozoon is composed of head and a tail. The head comprises the condensed nucleus of the cell with only a thin cytoplasmic and cell membrane layer around its surface. On the outside of the anterior two thirds of the head is a thick cap called the acrosome that is formed mainly from the golgi apparatus. This contains a number of enzymes similar to those found in lysosomes of the typical cell, including hyaluronidase (which can digest proteoglycan filaments of tissue) and powerful proteolytic enzymes (which can digest proteins). These enzymes play important roles in allowing the sperm to enter the ovum and fertilize it.

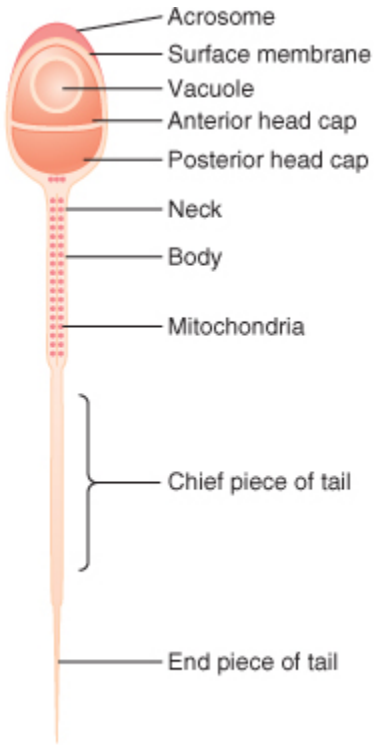
The tail of sperm called the flagellum has three major components:

(1) A central skeleton constructed of 11 microtubules, collectively called the axoneme the structure of this is similar to that of cilia found on the surfaces of other types of cells
(2) A thin cell membrane covering the axoneme
(3) A collection of mitochondria surrounding the axoneme in the proximal portion of the tail.

Back and forth movement of the tail (flagella movement) provides motility for the sperm. This movement results from a rhythmical longitudinal sliding motion between and anterior and posterior tubules that make up the axoneme. The energy for this process is supplied in the form of adenosine tri phosphate that is synthesized by the mitochondria in the body of tail.

Normal sperm move in a fluid medium at a velocity of 1-4 mm /min. This allows them to move through the female genital tract in quest of the ovum.

STRUCTURE OF THE HUMAN SPERMATOZOON



Hormonal factors that stimulate spermatogenesis

(1) Testosterone

It is secreted by the leydig cells located in the interstitium of the testis. It is essential for growth and testicular germinal cells, which is the first stage in forming sperm.

(2) Luteinizing hormone, secreted by the anterior pituitary gland, stimulates the leydig cells to secrete testosterone.

(3) Follicle stimulating hormone

It is secreted by the anterior pituitary gland stimulates the sertoli cells; without this stimulation the conversion of the spermatids to sperm will not occur.

(4) Estrogens

It is formed from testosterone by the sertoli cells when they are stimulated by follicle stimulating hormone.

(5) Growth hormone

It is necessary for controlling background metabolic functions of the testes. Growth hormone specifically promotes early division of spermatogonia themselves.

Maturation of sperm in the epididymis

After formation in the seminiferous tubules, the sperm require several days to pass through the 6-meter long tubule of the epididymis. Sperm removed from the seminiferous tubules and from the early portions of the epididymis are non-motile, and they can not fertilize an ovum. However after the sperm have been in the epididymis for some 18 to 24 hours they develop the capability of motility even though several inhibitory proteins in the epididymal fluid still prevent final motility until after ejaculation.

Storage of sperm

The two testes of the human adult form up to 120 million sperm each day. A small quantity of these can be stored in the epididymis but most are stored in the vas deferens. They can remain stored maintaining their fertility for at least a month. During this time they are kept in a deeply suppressed inactive state by

multiple inhibitory substances in the secretions of the duct. Conversely with a high level of sexual activity and ejaculations storage may be no longer than a few days.

After ejaculation the sperm become motile and they also become capable of fertilizing the ovum, a process called maturation. The sertoli cells and the epithelium of the epididymis secrete a special nutrient fluid that is along ejaculated with sperm. This fluid contains hormones and enzymes and special nutrients that are essential for sperm maturation.

Physiology of the mature sperm.

The activity of sperm is greatly enhanced in a neutral and slightly alkaline medium as exists in the ejaculated semen but it is greatly depressed in a mildly acidic medium. A strong acidic medium can cause rapid death of sperm.

The activity of sperm increases markedly with increasing temperature. although the sperm can live for many weeks in the suppressed state in the genital ducts of the testes. Life expectancy of ejaculated sperm in the female genital tract is only 1 to 2 days.

Functions of sertoli cells

1. The support, protection and nutritional regulation of the developing sperm
2. The breaking down of cellular debris cast off by developing sperm
3. The secretion of a fluid that is utilized for sperm transport
4. The excretion of estrogen and a binding protein for testosterone.

Functions of seminal vesicles

Each seminal vesicle is a tortuous, lobulated tube lined with a secretory epithelium that secretes a mucoid material containing an abundance of fructose, citric acid and other nutrient substances as well as large quantities of prostaglandins and fibrinogen. During the process of emission and ejaculation each seminal vesicles empties its content in to the ejaculatory duct shortly after he vas deferens empties the sperm until one of the sperm fertilizes the ovum.

Prostaglandins are believed to aid fertilization in two ways

(1) By reacting with the female cervical mucous to make it more receptive to sperm movement

(2) By possibly causing backward, reverse peristaltic contractions in the uterus and fallopian tubes to move the ejaculated sperm toward the ovaries.

Functions of the prostate gland

The prostate secretes a thin milky fluid that contains calcium citrate ion phosphate ion, a clotting enzyme and a profibrinolysin. During emission the capsule of the prostate gland contracts simultaneously with the contraction of the vas deferens so that the thin milky fluid of the prostate gland adds further to the bulk of the semen. A slightly alkaline characteristic of the prostatic fluid may be important for the successful fertilization of the ovum. The fluid of the vas deferens is relatively acidic owing to the presence of the citric acid. The vaginal secretions of the female are acidic (ph of 3.5 to 4). Sperm do not become optimally motile until the ph of the surrounding fluids rises to 6 to 6.5. The alkaline prostatic fluid helps to neutralize the acidity of the other seminal fluids during ejaculation and thus enhances the sperm motility and the fertility of the sperm.

Semen

Semen is ejaculated during male sexual act.

Composition

Fluid and sperm from the vas deferens -10 percent of the total

Fluid from the seminal vesicle - 60 percent

Fluid from the prostate gland – 30 percent

Small amounts from mucous glands especially bulbo urethral glands.

The average pH of the combined semen is about 7.5. The prostatic fluid gives the semen a milky appearance and fluid from the seminal vesicles and mucous glands gives the semen a mucoid consistency. A clotting enzyme from the prostatic fluid causes the fibrinogen of the seminal vesicle fluid to form a weak fibrin coagulum. The coagulum holds the semen in the deeper region of the vagina. The coagulum then dissolves during the next 15 to 30 minutes.

The sperm can live for many weeks in the male genital ducts once they are ejaculated in the semen. Their maximal life span is only 24 to 48 hours at body temperature. At lowered temperature semen can be stored for several weeks.

Capacitation of the spermatozoa

The spermatozoa are said to be mature when they leave the epididymis. Their activity is held in check by multiple inhibitory factors secreted by the genital duct epithelia. However on coming in contact with the fluids of the female genital tract multiple changes occur that activate the sperm for the final process of the fertilization. These collective changes are called
capacitation of the spermatozoa. This normally requires 1 to 10 hours.

The acrosome reaction

Large quantities of hyaluronidase and proteolytic enzymes are stored in the acrosome of the sperm. The hyaluronidase depolymerizes the hyaluronic acid polymers in the intercellular cement that hold the ovarian granulosa cells together. The proteolytic enzymes digest proteins in the structural elements of the tissue cells.

Penetration of the ovum

When the ovum is expelled from the ovarian follicle in to the fallopian tube it still carries with it multiple layers of granulose cells. Before a sperm can fertilize the ovum it must dissolutes these granulose cell layers. Then it must penetrate the zona pellucida. To achieve this stored enzyme in the acrosome begin to be released. The hyaluronidase is important in opening pathways between the granulose cells. When the sperm reaches the zona pellucida of the ovum the anterior membrane of the sperm itself binds with the receptor proteins in the zona pellucida.then all the acrosomal enzymes are released. Within another 30 minutes the cell membranes of the sperm head and of the oocyte fuse with each other to form a single cell. At the same time the genetic material of the sperm and the oocyte combine to form a completely new cell genome containing equal

numbers of chromosomes and genes from mother and father. This is the process of the fertilization.

Within a few minutes after the first sperm penetrates the zona pellucida of the ovum calcium ions diffuse inward through the oocyte membrane and cause multiple cortical granules to be released from the oocyte. These granules contain substances that permeate all portions of the zonapellucida and prevent binding of additional sperm.

Male sexual act

Neuronal stimulus for performance of the male sexual act

The most important source of sensory nerve signals for initiating the male act is glans penis. The glans contains an especially sensitive sensory end organ system that transmits into the central nervous system that special modality of sensation called the sexual sensation. The slippery massaging action of intercourse on the glans stimulates the sensory end organs and the sexual signals in turn pass through the pudendal nerve, then through the sacral plexus in to the sacral portion of the spinal cord. Finally the signals pass into the areas of brain.

Impulses may also enter the spinal cord from areas adjacent to the penis to aid in stimulate the sexual act. Sexual sensation can even originate in internal structures such as in areas of the urethra, bladder, prostate, seminal vesicles and testes and vas deferens.

Psychic element of the male sexual stimulation

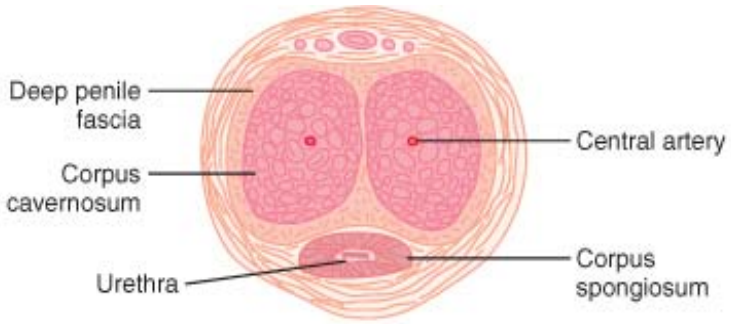
Appropriate psychic stimuli can greatly enhance the ability of the person to perform the sexual act. Simply thinking sexual thoughts or even dreaming that the act of intercourse is being performed can initiate the male act, culminating in ejaculation. Indeed nocturnal emissions during dreams occur in many males during some stages of sexual life, especially during the teens.

Stages of Male sexual act.

Penile erection – role of parasympathetic nerves

Penile erection is the first effect of male sexual stimulation and the degree of erection is proportional to the degree of stimulation, whether psychic or physical. The parasympathetic fibres are believed to release nitric oxide and vasoactive intestinal peptide in addition to acetylcholine. The nitric oxide especially relaxes the arteries of the penis as well as relaxes the trabecular meshwork of smooth muscle fibres in the erectile tissue of carpora cavernosa and corpora spongiosum. This erectile tissue consists of large cavernous sinusoids which are normally empty of blood. It dilates tremendously when arterial blood flows rapidly into them under pressure while the venous outflow is partially occluded. The high within the sinusoids causes ballooning of erectile tissue to such an extent that the penis becomes hard and elongated.

ERECTILE TISSUE OF THE PENIS



Lubrication, a parasympathetic function

During sexual stimulation the parasympathetic impulses causes the urethral gland and bulbo urethral glands to secrete mucus. This mucus flows through the urethra during intercourse to aid in the lubrication during coitus. However most of the lubrication of coitus is provided by the female sexual organs rather than by male. Without satisfactory lubrication the male sexual act is

seldom successful because unlubricated intercourse causes grating painful sensations that inhibit rather than excite sexual sensation.

Emission and Ejaculation – Function of Sympathetic nerve

Emission and ejaculation are culmination of male sexual act when the sexual stimulus becomes extremely intense the reflex centers of the spinal cord begin to emit sympathetic impulses.

Emission begins with contraction of vas deferens and the ampulla to cause expulsion of sperm on to internal urethra. Then the contraction of muscular coat of the prostate gland followed by the contraction of the seminal vesicles expels prostatic and seminal fluid also into the urethra forcing the sperm forward. All these fluids mix in the internal urethra with mucus already secreted by the bulbo urethral glands to form the semen. The filling of the internal urethra with semen elicits sensory signals that are transmitted through the pudendal nerves.

These sensory signals further excite rhythmical contraction of the internal genital organs and cause contraction of the ischiocavernosus and bulbocavernosus muscle that compress the bases of the penile erectile tissue. These effects together cause rhythmical wave like increases in pressure in both the erectile tissue of the penis and genital ducts and urethra which ejaculate the semen from urethra to the exterior. This final is called the ejaculation. At the same time rhythmical contraction of the pelvic muscles and even of some of the muscles of the body trunk cause trusting movements of the pelvis and penis which also help propel the semen in to the deepest recesses of the vagina and perhaps even slightly in to the cervix of the uterus. This entire period of emission and ejaculation is called the male orgasm. At its termination, the male sexual excitement disappears almost entirely within 1 to2 minutes and erection ceases, a process called resolution.

The Male sexual hormones

The testes secrete several male sexual hormones, which are collectively called androgens, including testosterone, dihydrotestosterone, and androstenedione.

Testosterone is formed by the interstitial cells of the leydig, which lie in the interstices between the seminiferous tubules. Leydig cells are almost non existent in the testes during childhood when testes secrete almost no testosterone, but they are numerous in the new born male infant for the first few months of life and in the adult male any time after puberty. The testes secrete large quantities of testosterone.

Secretion of Androgens

The term “androgen” means any steroid hormone that has masculinizing effects, including testosterone. It also includes male sex hormones produced elsewhere in the body besides the testes. The adrenal gland secretes at least five androgens.

Production of estrogen in the male

Small amount of estrogens are formed in the male. A reasonable quantity of estrogen can be recovered from a man’s urine. The concentration of estrogens in the fluid of seminiferous tubules is quite high and plays an important role in spermiogenesis.

Functions of Testosterone

1. It is responsible for the distinguishing characteristics of the masculine body.

2. Testosterone causes the secondary sexual characteristics of the male to develop, beginning at puberty and ending at maturity.

3. After puberty the increasing amount of testosterone secretion cause the penis, scrotum, and testes to enlarge about eightfold before the age of 20 years.

4. Effects on distribution of body hair

Testosterone cause the growth of hair (a) Over the pubis, (b) upward along the linea alba of the abdomen, (c) on the face, (d) usually on the chest, (e) less often on the regions of the body.

5. Testosterone decreases the growth of hair on the top of the head. However Many virile man never become bald.

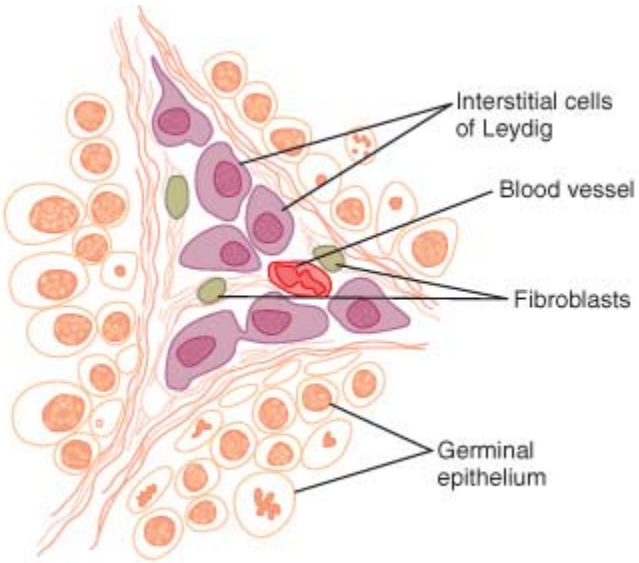
6. Testosterone secreted by the testes cause hypertrophy of laryngeal mucosa. This effects cause at first a relatively discordant “cracking” voice, but this gradually changes in to the typical adult masculine voice.

7. Testosterone increases the thickness of the skin over the entire body and increases the ruggedness of the subcutaneous tissues. Testosterone also increases the rate of secretion by some or perhaps all the body’s sebaceous glands.

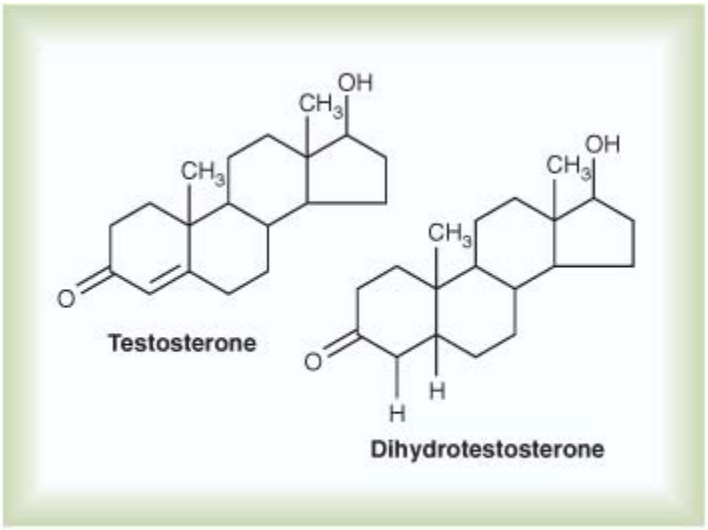
8. Testosterone increases the protein formation and muscle development. One of the most important male characteristics is development of increasing musculature after puberty, averaging about a 50 percent increase in the muscle mass over that in the female. This associated with increased protein in the non-muscular parts of the body. Many of the changes in the skin are due to depositions of proteins in the skin.

9. Testosterone increase in the total quantity of bone matrix and causes calcium retention. The increase in bone matrix is believed to result from the general protein anabolic function of the testosterone plus deposition of calcium salts in response to the increased protein. Testosterone also causes the epiphysis of the long bones to unite with the shafts of the bone at an early age.

INTERSTITIAL CELLS OF LEYDIG



TESTOSTERONE AND DIHYDROTESTOSTERONE



10. testosterone has a specific effect on pelvis to (1) to narrow the pelvic outlet, (2) lengthen it, (3) cause a funnel like shape instead of broad ovoid shape of the female pelvis, (4) greatly increase the strength of the entire pelvis for load – bearing.

11. The usual quantity of the testosterone secreted by the testes during adolescence and early adult life increases the rate of metabolism some 5 to 10 percent above the value. The increased rate of metabolism is possibly an indirect result of effect on testosterone on protein anabolism.

Control of Male sexual functions by hormones

A major share of the control of sexual functions in both male and female begins with secretion of gonadotropin releasing hormone (GnRH) by the hypothalamus. This hormone in turn stimulates the anterior pituitary gland to secrete two other hormones called the gonadotropic hormones.

1. Luteinizing hormone (LH) – it is the primary stimulus for the secretion of testosterone by the testes.
2. Follicle stimulating hormone (FSH) – it stimulates spermatogenesis.

GnRH and its effects

GnRH is 10 amino acid peptide secreted by neurons of the hypothalamus. The endings of these neurons mainly terminate in the median eminence of the hypothalamus, where they release GnRH in to the hypothalamus – hypophysial portal vascular system. Then the GnRH is transported to the anterior pituitary gland in the hypophysial portal blood and stimulates the release of the two gonadotropins, LH and FSH.

GnRH is secreted intermittently a few minutes at a time once every 1 to3 hours. The intensity of this hormones stimulus is determined in two ways.

1. by the frequency of these cycles of secretion,
2. By the quantity of GnRH released with each cycle.

Both the LH and FSH are secreted by the gonadotropes in the anterior pituitary gland. They exert their effects on their target tissues in the testes mainly

by activating the cyclic adenosine monophosphate second messenger system, which in turn activates specific enzyme systems in the respective target cells.

Negative feedback control of Testosterone secretion

The testosterone secreted by the testes in response to LH has the reciprocal effect of inhibiting anterior pituitary secretion of LH. Most of this inhibition probably results from a direct effect of testosterone on the hypothalamus to decrease the secretion of GnRH.

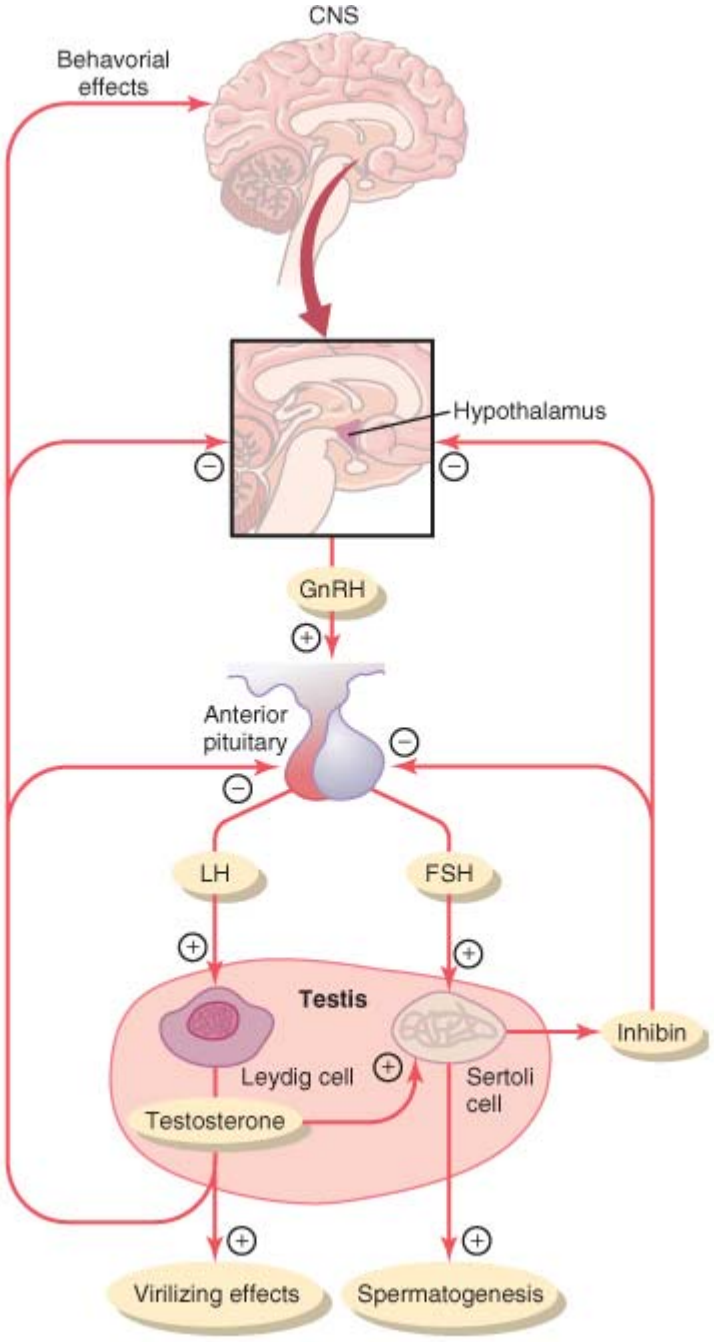
This in turn causes a corresponding decrease in secretion of both LH and FSH by the anterior pituitary, and the decrease in the LH reduces the secretion of testosterone by the testes. Thus, whenever the testosterone secretion becomes too great, this automatic negative feedback effect, operating through the hypothalamus and anterior pituitary gland, reduces the testosterone secretion back toward the desired operating level. Conversely, too little testosterone allows the hypothalamus to secrete large amounts of GnRH, with a corresponding increase in anterior pituitary LH and FSH secretion and consequent increase in testicular testosterone secretion.

When the seminiferous tubules fail to produce the sperm, secretion of FSH by the anterior pituitary gland increases markedly. Conversely when spermatogenesis proceeds too rapidly, pituitary secretion of FSH diminishes. The cause of this negative feedback effect on the anterior pituitary is believed to be secretion by the sertoli cells of still another hormone called inhibin. This hormone has a strong direct effect on the anterior pituitary gland to inhibit the secretion of FSH and possibly a slight effect on the hypothalamus to inhibit the secretion of GnRH.

Testosterone secretion by the fetal testes

During pregnancy, the hormone human chorionic gonadotropin is secreted by the placenta, and it circulates both in the mother and in the fetus.

FEEDBACK REGULATION OF THE HYPOTHALAMIC – PITUITARY TESTICULAR AXIS IN MALE



During pregnancy, if the fetus is a male, HCG from the placenta causes the testes of the fetus to secrete testosterone. This testosterone is critical for promoting formation of the male sexual organs.

Abnormalities of Male sexual function

Prostate gland and its abnormalities

The prostate gland remains relatively small throughout childhood and begins to grow at puberty under the stimulus of testosterone. This gland reaches an almost stationary size by the age of 20 years and remains at this size up to the age of about 50 years. At that time in some men it begins to involutes along with decreased production of testosterone by the testes.

A benign prostatic fibro adenoma frequently develops in the prostate in many older men and cause urinary obstruction. This hypertrophy is caused not by testosterone but instead by abnormal overgrowth of prostate tissue itself.

Once the cancer of the prostate gland does occur the cancerous cells are usually stimulated to more rapid growth by the testosterone and are inhibited by the removal of both testes so that testosterone can not be formed. Prostatic cancer usually can be inhibited by administration of estrogen.

Hypogonadism in the male

When a boy loses his testes before puberty a state of eunuchism ensues in which he continues to have infantile sex organs and other infantile sexual characteristics throughout life. The height of the adult eunuch is slightly greater than that of a normal man because the bone epiphyses are slow to unite, although the bones are quite thin and the muscles are considerably weaker than those of a normal man. The voice is childlike there is no loss of hair on the head and the normal adult masculine hair distribution on the face and elsewhere does not occur.

When a male is castrated after puberty, some of his male secondary sexual characteristics revert to those of a child and others remain of adult masculine character. The sexual organs regress slightly in size but not to a childhood state and the voice regresses from the bass quality only slightly. There

is loss of masculine hair production loss of thick masculine bones and loss of the musculature of the virile male.

Some instances of hypogonadism are caused by a genetic inability of the hypothalamus to secrete normal amount of GnRH. This often is associated with a simultaneous abnormality of the feeding centre of the hypothalamus causing the person to greatly overeat. Consequently obesity occurs along with eunuchism. The condition is called adiposogenital syndrome, frohlich's syndrome or hypothalamic eunuchism.

Effect of Temperature on Spermatogenesis

Increasing the temperature of the testes can prevent spermatogenesis by causing degeneration of most cells of the seminiferous tubules besides the spermatogonia. It has often be stated that the reason the testes are located in the dangling scrotum is to maintain the temperature of these glands, below the internal temperature of the body, although usually only about 2º C below the internal temperature. On cold days scrotal reflexes cause the musculature of the scrotum to contract, pulling the testes close to the body to maintain this 2º differential. Thus the scrotum theoretically acts as a cooling mechanism for the testes.

Cryptorchidism

Cryptorchidism means failure of the testis to descent from the abdomen in to the scrotum at or near the time of birth of a fetus. During development of the male fetus, the testes are derived from the genital ridges in the abdomen. However, at about 3 weeks to 1 month before the birth of the baby, the testes normally descent through the inguinal canals in to the scrotum. A testis that remains throughout the life in the abdominal cavity is incapable of forming sperm. The tubular epithelium becomes degenerate, leaving only the interstitial structures of the testis.

NUTRITIONAL CONSIDERATIONS

Vitamin C and other Anti – oxidants

Free radical or oxidative damage to sperm is thought to be responsible for many cases of idiopathic oligospermia, with high levels of free radicals found in the semen of 40% infertile men. Three factors combine to render sperm particularly susceptible to free radical damage:

A high membrane concentration of polyunsaturated fatty acids

Active generation of free radicals

A lack of defensive enzymes.

All of these factors combine to make the health of the sperm critically dependent upon antioxidants. Although most free radicals are produced during normal metabolic processes, the environment contributes greatly to the free radical load. Men exposed to increased levels of sources of free radicals are much more likely to have abnormal sperm and sperm counts.

Sperm are extremely sensitive to free radicals because they are so dependent upon the integrity and fluidity of their cell membrane for proper function. Without proper membrane fluidity, enzymes are activated, which can lead to impaired motility, abnormal structure, loss of viability and ultimately death of sperm. The major determinant of membrane fluidity is the concentration of polyunsaturated fatty acids, particularly omega – 3 fatty acids, which are very susceptible to free radical damage. The sperm have a relative lack of super oxide dimutase and catalase which can prevent oxidative damage.

A common source of oxide is cigarette smoking, which is associated with decreased sperm counts and sperm motility as well as an increased frequency of abnormal sperm. Increase in environmental pollution, is thought to be a major contributor to the decreased in sperm counts seen in many industrialized nations. Antioxidants such as vitamin C, beta- carotene, selenium and vitamin E have been shown to be very important in protecting the sperm against the damage. Vitamin C plays an important role in protecting the sperm's genetic material (DNA) from damage. Ascorbic acid levels are much higher in seminal fluid

compared with other body fluids. When dietary vitamin C was reduced from 250 to 5 mg/ day in healthy human subjects, the seminal fluid ascorbic acid decreased by 50% and the number of sperm with damage to their DNA increased by 91%.

It is well documented that cigarette smoking greatly reduces vitamin C levels throughout the body. Vitamin E has been shown to play an essential role in inhibiting free radical damage to the unsaturated fatty acids of the sperm membrane. Vitamin E enhances the ability of sperm to fertilize an egg in test tubes.

Fats and oils

Saturated fats, hydrogenated oils, trans- fatty acids, cotton seed, coconut and palm oil should be avoided. Coconut and palm oils are primarily saturated fat, while cotton seed may contain toxic residues, due to heavy spraying of cotton and its high levels of gossypol, a substance known to inhibit the sperm function. Infact, gossypol is being investigated as the “male birth control pill”. Its use as an antifertility agent began after studies demonstrated that men who had used crude cotton seed oil as their cooking oil were shown to have low sperm counts followed by total testicular failure. Excessive consumption of saturated fats combined with inadequate intake of essential fatty acids changes the fatty acid composition of sperm membranes, thus decreasing fluidity and interfering with sperm motility. The patient must be informed to read food labels carefully and avoid all sources of cotton seed oil and other damaging oils. While the intake of saturated and hydrogenated fats must be eliminated, the intake of polyunsaturated oils should be increased. These oils function in all aspects of sexual function including sperm formation and activity.

Zinc

Zinc is perhaps the most critical trace mineral for male sexual function. It is involved in virtually every aspect of male reproduction including the hormone metabolism, sperm formation and sperm motility. Zinc deficiency is characterized by decreased testosterone levels and sperm counts. Zinc levels are typically

much lower in infertile men with low sperm counts, indicating that a low zinc status may be the contributing factor to the infertility. Zinc is found in whole grains, legumes, nuts and seeds.

Vitamin B12

Vitamin B12 is involved in cellular replication. A deficiency of vitamin b12 leads to reduced sperm counts and sperm motility.

Arginine

The amino acid arginine is required for the replication of cells, making it essential in sperm formation. Arginine supplementation is often, but not always, an effective treatment of male infertility. The critical determinate appears to be the level of oligospermia.

Carnitine

Carnitine is essential in the transport of fatty acids in to the mitochondria. A deficiency of carnitine results in a decrease in fatty acid concentrations in the mitochondria and reduced energy production. Carnitine concentrations are extremely high in the epididymis and sperm, suggesting a role for carnitine in male reproductive function. The epididymis derives the majority of its energy requirements from fatty acids, as do the sperm, during transport through the epididymis. After ejaculation, the motility of sperm correlates directly with carnitine content. The higher the carnitine content, the more motile are the sperm. Supplementing the diet with L- carnitine may be useful in restoring male fertility. The optimal dosage is 300 -1000 mg of L - carnitine three times daily.

SEMEN COLLECTION

It is usually recommended that the semen sample be collected following a three day period of continence. Others have suggested that a more meaningful specimen is one collected after a period of continence equal to the usual frequency of coitus for the couple involved. Prolonged continence prior to the semen collection is to be discouraged because the quality of semen, especially in regard to sperm motility, will actually diminish.

The most satisfactory specimen is that collected in the clinical laboratory by masturbation. This allows a complete examination of the semen, particularly of the process of coagulation and liquefaction, and also eliminates the possibility of cold shock.

The specimen can be collected in a wide - mouth clean glass jar supplied by the laboratory or in suitable plastic or polyethylene containers. Specimens may be collected in condoms, which are then tied and placed in a clean glass jar. Valid objections to condom collection have been expressed because of the fact that powder of lubricants applied to the condoms or other material used in their manufacture may be actively spermicidal. If the condom is used, it must first be washed with soap and water, rinsed thoroughly, and then dried completely. Plastic sheaths have been recommended as a means of avoiding the difficulties of condom collection.

The container should be warmed to body temperature prior to collection. It is desirable to keep the specimen at body temperature until liquefaction of the coagulum is complete (about 20 minutes).

Gross examination

Physical characteristics

Freshly ejaculated semen is a highly viscid, opaque, white or gray - white coagulum, which has a distinct musty or acrid odor. Within 10 to 20 minutes the coagulum will spontaneously liquefy to form a translucent, turbid, viscous fluid, which is mildly alkaline, with a pH of about 7.7. The pH usually does not vary greatly. The PH values of less than 7 are frequently associated with semen

consisting largely of prostatic secretion due to congenital aplasia of the vas deferentia and seminal vesicles. Viscosity can be assessed while pouring the liquefied specimen from the collection container in to the glass graduate for volume measurement. The specimen of normal viscosity can be poured drop by drop. Increased viscosity is associated with poor invasion of the cervical mucus in post coital studies and is the only demonstrable defect in an infertile couple.

Coagulation and liquefaction

(1) Coagulation results from the action of a prostatic clotting enzyme on a fibrinogen like precursor formed by the seminal vesicle.

(2) Liquefaction is initiated by the enzymes of prostatic origin.

(3) The protein fragments are degraded further to free amino acids and ammonia by the action of several poorly characterized proteolytic enzymes, including of amino peptidase and pepsin.

Liquefaction should be complete within 30 minutes. It is important to distinguish persistently increased viscosity from delayed liquefaction.

Volume

The normal semen volume averages 3 to 4 ml. The males associated with infertile marriages tend to have an increased rather than a decreased semen volume, which is frequently associated with a significantly diminished sperm count. A post coital study suggests that greatly decreased semen volumes can result in poor penetration of the cervical mucus by the sperm. Semen volume does not vary significantly with the period of continence.

Microscopic examination

Sperm counts

Following liquefaction of the semen, the spermatozoa can be counted in a hemocytometer chamber following initial dilution in a white blood cell pipette. Mix the semen sample thoroughly and draw an aliquot to the 0.5 mark on the pipette. Dilute to the 11 mark with the following solution:

Sodium bicarbonate - 5g

Formalin (neutral) – 1ml

Distilled water - 100 ml

After charging the homocytometer chamber, two minutes are allowed for the immobilized sperm to settle. The spermatozoa in 2 sq mm (2 large squares) are counted. This number multiplied by 100, 000 gives the number of spermatozoa per milliliter. The entire counting procedure including the initial dilution should be repeated at least once and the results averaged.

Considerable difficulty can be encountered in diluting semen of greatly increased viscosity. Under these circumstances the counting will be facilitated if the semen is diluted 1: 1 with the mucolytic agent alevaire prior to pipette solution and the final count is multiplied by two.

Sperm Motility

To evaluate motility, a small drop of liquefied semen is placed on a microscope slide pre-warmed approximately to body temperature and then covered with a cover slip which has been ringed with petrolatum. Motility can be evaluated by scanning several fields with the high dry objective until a total of at least 200 spermatozoa have been observed. It is essential to focus through the entire depth of a given field so as to include non – motile sperm that have settled to the bottom of the medium. The percentage of the sperm showing actual progressive motion should be recorded.

Sperm Morphology

Sperm morphology is evaluated by performing differential counts of morphologically normal and abnormal spermatozoa types on stained smears. Smears are prepared on cleaned microscope slides in a manner identical to blood films. The best stain for morphologic detail is the papanicolaou stain.

At least 200 spermatozoa should be examined under oil immersion and the percentage of abnormal forms recorded. In addition to sperm morphology, the presence of red blood cells, leukocytes, and epithelial cells should be noted.

Immature cells of the germinal line can appear in the semen and must be differentiated from macrophages or leukocytes. Numerous granules and globules are normally present in semen.

ABNORMAL INFERTILE SPERM COMPARED WITH A NORMAL SPERM IN THE RIGHT

Endocrinologic evaluation

It is warranted if sperm counts are low or if there is a clinical basis (from the history and physical examination) for suspecting an endocrinologic origin. Testing should include serum FSH and LH and testosterone. Elevated FSH, LH and low testosterone are associated with primary testicular failure, which is usually irreversible. Low FSH and LH associated with low testosterone occur in secondary testicular failure and may be of hypothalamic or pituitary origin. Such defects may be correctable. In such cases serum prolactin should be checked to exclude pituitary prolactinoma.

Imaging

Scrotal ultra sound may detect a subclinical varicocele. Vasography may be required in patients with suspected ductal obstruction.

ADVANCED SPERM FERTILITY TESTS

(a) Computer-Assisted Semen Analysis (CASA)

CASA was introduced in the 1980s to provide an automated, objective, and standardized evaluation of sperm concentration and movement. The variables measured by most CASA systems are sperm density, percent motility, straight-line velocity, and curvilinear velocity, linearity, and average path velocity, amplitude of lateral head displacement, flagellar beat frequency, and hyper activation. This technology is based on digitalized sperm images that are visualized by a video camera and analyzed by a computer.

Disadvantages of CASA include standardization of specimen preparation, cost, technician expertise, and an understanding of the limitations of computer-based analysis. In addition, CASA can be highly inaccurate when measuring spermatozoa at very high or very low concentrations. Routine use of CASA in the andrology laboratory is controversial in part because of a lack of understanding of the specifications and limits of this equipment and also because in the majority of cases CASA may offer little clinical advantage over routine semen analysis.

(b) Hypo-Osmotic Swelling Test (HOS)

In 1984, Jeyendran reported that under hypo-osmotic conditions (150 mosm/L), a normal spermatozoon will absorb fluid resulting in bulging of the plasma membrane and curling of its tail. This test is based upon the principle that a living spermatozoon can maintain an osmotic gradient whereas a dead cell cannot.

This curling is readily detected by using phase-contrast microscopy. This simple test measures the physical and functional integrity of the plasma membrane and therefore viability. In an abnormal sample, less than 50% of spermatozoa swell; in a normal one, more than 60% of spermatozoa react. The investigators believe that when performed properly, this test provides functional information independent of other fertility tests and is particularly useful when no

swelling is seen, correlating in this instance with very poor IVF results. This assay can differentiate immotile but viable spermatozoa from necrospermia. The HOS test is currently used most often in selecting live testicular sperm intracytoplasmic sperm injection (ICSI), where there is little or no motility.

(c) Viability Stain Assays

Viability stains are also used to determine if spermatozoa are alive and if the plasma membrane is intact. These tests are based on the principle that live cells can exclude dye whereas damaged dead cells cannot. The stains used are eosin Y and trypan blue. The vitality results of the stain assay and of the HOS test correlate very closely, since both evaluate the integrity of the plasma membrane. Similar to the HOS test, these assays add little to predicting prognosis of IVF results and determining a diagnosis, except in cases with very low or absent motility (by differentiating it from necrospermia). Unfortunately, once sperm are stained, they are no longer viable and cannot be used for ICSI.

(d) Cervical Mucus/Sperm Interaction Assays

The spermatozoa must travel through the cervical mucus to reach the uterus. Failure of passage through the cervical mucus is the primary cause of infertility for 10% of couples consulting for this condition. The quality of the cervical mucus varies during the menstrual cycle.

The postcoital test (PCT)

It is first performed by Sims more than 125 years ago, has traditionally been a common way to determine cervical mucus/sperm interaction. This test evaluates sperm concentration and motility in an aspirate of cervical mucus at midcycle shortly after the couple has intercourse. Results of a normal PCT would show the presence of 20 or more spermatozoa per high-power field. An abnormal PCT results most commonly is secondary to inappropriate timing of coitus. Other

causes include ASA, an ovulation, an abnormal hormonal milieu, female or male genital tract infections, poor semen quality, and male sexual dysfunction.

Because this test relies heavily on factors that are beyond the control of the clinic, the usefulness of the PCT in infertility investigation has been questioned. Whereas the presence of motile spermatozoa indicates that spermatozoa can survive in the cervical mucus, failure to find motile spermatozoa is more difficult to interpret.

Tests that investigate the *in vitro* interaction between spermatozoa found in semen and sperm-free midcycle mucus are also clinically useful. *In vitro* tests, such as the capillary test, were introduced in an attempt to standardize the sperm-mucus penetration capacity. The crossed mucus-hostility assay, which uses donor spermatozoa and mucus as controls, is utilized to determine if it is the male or female partner who is responsible for poor sperm-cervical mucus interaction. Recently, a commercial assay (Penetrak test) has been developed using bovine cervical mucus that is similar to human cervical mucus both biochemically and physiologically. However, this assay does not assess the female component of the cervical factor. The Tru-Trax Assay (Humagen) combines both approaches, placing human and bovine cervical mucus in adjacent wells. There is also disagreement of whether these assays correlate with one another, with motility and other semen variables. It is likely that the cervical mucus penetration test measures a sperm function that is independent of other sperm functions measured.

(e) Sperm Penetration Assay (SPA)

The SPA was developed to measure the functional properties of sperm and was initially developed following the observation that, upon the removal of the zona pellucida of hamster ova, the species specificity of fertilization and the block to polyspermy are lost. In particular, heterologous penetrations between hamster ova and sperm from a variety of species, including humans, has been observed.

Ideally, human ova should be used for this assay, but they are not widely available, and there are ethical problems associated with their use. Therefore, hamster ova have provided a useful model for the measurement of human sperm function.

For fertilization to occur *in vivo*, the sperm must first be capacitated and have undergone the acrosome reaction. The physiology of sperm capacitation is not clearly defined. In particular, it is not known whether capacitated sperm that have gained the ability to penetrate human ova have undergone the acrosome reaction, or whether this occurs as a local event at the time of gamete fusion. The use of SPA as a measure of potential fertility is based on the theory that fertile sperm samples will either penetrate most hamster ova or result in a significant amount of polyspermy of the penetrated ova. Infertile sperm samples are expected to penetrate a lower percentage of ova or result in a lesser degree of polyspermy.

Consideration should be given to obtaining the SPA in couples with unexplained infertility or in couples in whom the decision is being made to proceed with intrauterine insemination (IUI) or IVF, since lower SPA results have been predictive of poor success with IVF and lower pregnancy rates in couples attempting conception through intercourse.

(f) Reactive Oxygen Species (ROS) Assay

For cells living under aerobic conditions, oxygen represents a paradox: While it is required for survival and normal function, its metabolites can be potentially toxic due to the generation of oxygen-free radicals. Some of these metabolites, called ROS, have been shown to be produced by spermatozoa and to generate toxic effects on sperm function. However, when produced at the right time and amount, these ROS can also initiate and promote normal physiologic reactions such as sperm hyperactivation and capacitation. In human emen, high ROS formation was detected in 40% of semen samples from an unselected population of men consulting an infertility clinic.

NORMAL VALUES - WHO criteria

The WHO reference values for a normal semen analysis are defined as given below

Volume – 2 ml or more

Total sperm count - 40 millions per ejaculate or more

Sperm concentration - 20 millions per ejaculate or more

PH - 7•2 or higher

Motility

50 % or more motile

25% or more with progressive motility, within 60 minutes of ejaculation

Motility is graded from a to d according to WHO manual criteria

a – Fast progressive

Sperms are those which swim forward fast in a straight line, like guided missiles

b – Slow progressive

Sperms swim forward, but either in a curved or crooked line or slowly.

c – Non progressive

Sperms move their tails, but do not move forward. (local motility only)

d – Immotile

Sperms do not move at all.

Sperms of grade c & d are considered poor.

Morphology

Head - The head should be oval and smooth.

Mid piece - the mid piece should be straight and slightly thicker than the tail.

Tail - the tail should be single, unbroken, straight and without coils.

MATERIALS AND METHODS

1. POPULATION & SAMPLE

The population consists of male infertility patients [sperm count less than 20 millions / ml OR sperm motility below 50%] satisfying the inclusion and exclusion criteria mentioned below.

The sample consists of male infertility patients attending the OPD of Ayothidoss Pandithar Hospital of the National Institute of Siddha Chennai-47.

2. INCLUSION CRITERIA

Age group 25 - 45 years

Willing to give specimen of semen for the investigation.

3. EXCLUSION CRITERIA

1. Azoospermia
2. Hydrocele & varicocele
3. Diabetes mellitus
4. Hypertension
5. Cardiac diseases

4. WITHDRAWAL CRITERIA

Development of hydrocele and varicocele during treatment period.

5. TRIAL DRUG AND DURATION

Murungaipoo lehyam – 5 g twice a day

Trial treatment period is 90 days.

6. SAMPLE SIZE

The trial size is 20 patients.

7. TESTS AND ASSESSMENT

(a) CLINICAL ASSESSMENT

Ejaculatory effect, Erectile function, Nocturnal emission, Painful coitus, Painful micturition.

(b) ASSESSMENT BY INVESTIGATION

SEMEN ANALYSIS

Volume, Colour, Appearance, Viscosity, Liquification time, Sperm count (millions / ml), Motility (%), Morphology (%

BLOOD

TC(cells / cu mm), DC (%), ESR (mm /hr), Hb (g%), sugar (mg %), VDRL.

URINE

Albumin, Sugar, Deposit, Neerkuri, Neikuri

8. CONDUCT

Patients satisfying inclusion and exclusion criteria are selected for the study. Informed consent will be obtained from the patients.

They will be instructed to come for next clinic visit after 10 days. Also they will be asked to bring back the unconsumed drug during their next visit and return the same.

9. FORMS

Form -1

Selection proforma – used before admission to the trial

Form -2

Assessment proforma – used during clinic visits once in 10 days

10. ANALYSIS

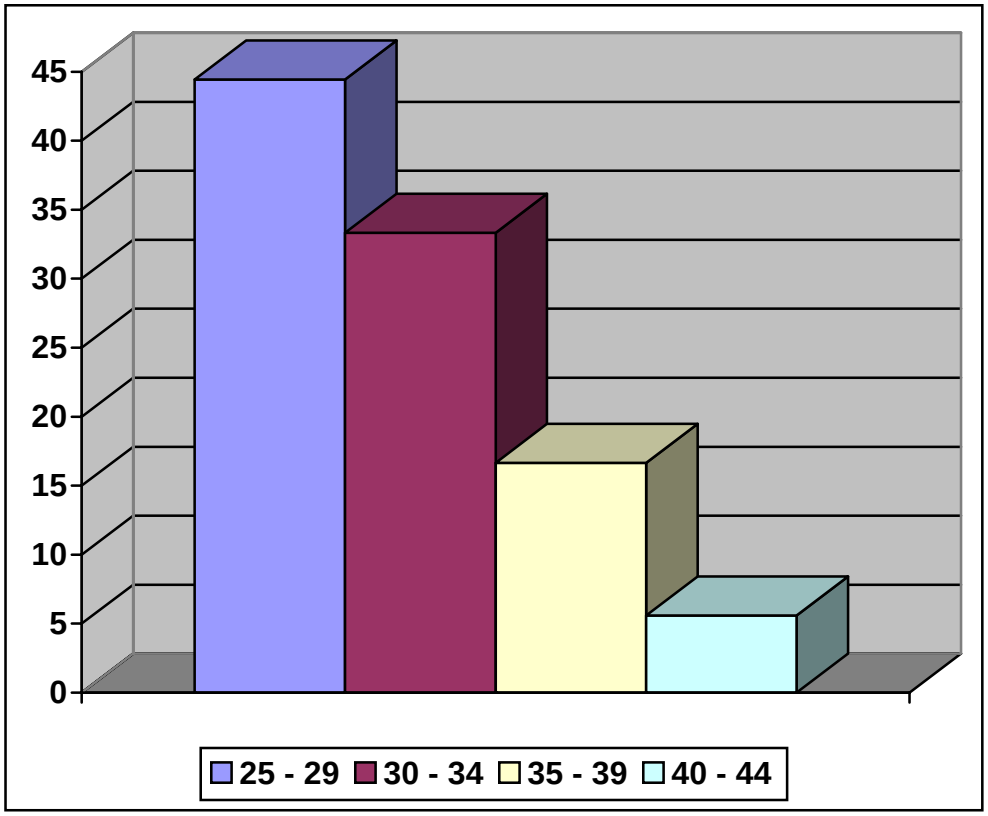
Paired **t** test for means of before & after treatment

Paired **chi** squared test for proportion of signs & symptoms before & after treatment

OBSERVATION AND RESULTS

1. Age Distribution

Age (Yrs)	Cases	
	No	Percentage (%)
25 - 29	8	44.44
30 - 34	6	33.33
35 - 39	3	16.66
40 - 44	1	5.6
Total	18	100



2. Occupational History

Working in Hot atmosphere	Cases	
	No	Percentage (%)
Yes	6	33.33
No	12	66.66
Total	18	100

3. Food Habits

Food Habits	Cases	
	No	Percentage (%)
Veg.	-	-
Non-Veg	18	100
Total	18	100

4. Habits

Habits	Cases	
	No	Percentage (%)
Smoking	1	5.6
Alcohol	1	5.6
Tobacco Chewing	2	11.1
Total	4	22.3

5. Duration of Marriage

Duration (Yrs)	Cases	
	No	Percentage (%)
0 - 3	10	55.6
4 - 6	5	27.8
7 - 9	1	5.5
10 +	2	11.1
Total	18	100

6. Thinai

Thinai	Cases	
	No	Percentage (%)
Kurunji	-	-
Mullai	-	-
Marutham	2	11.1
Neithal	16	88.9
Palai	-	-
Total	18	100

7. Paruvakalam

Paruvakalam	Cases	
	No	Percentage (%)
Kar	9	50.0
Koothir	-	-
Munpani	4	22.2
Pinpani	2	11.1
Elavenil	-	-
Muthuveni	3	16.6
Total	18	100

8. History of Masturbation

Duration (Yrs)	Cases	
	No	Percentage (%)
0 - 5	3	16.6
6 - 10	2	11.1

9. Clinical Features

Symptoms	Cases	
	No	Percentage (%)
Pre-mature ejaculation	11	61.1
Erectile dysfunction	5	27.8
Painful coitus	2	11.1
Painful micturition	4	22.2
Nocturnal emission	7	38.9
Scrotal Swelling	-	-
No Symptoms	5	27.8

10. Udal Thathukkal

Udal Thathukkal	Cases	
	No	Percentage (%)
Saarum	13	72.2
Senneer	9	50.0
Oon	5	27.8
Kozhuppu	3	16.6
Enbu	-	-
Moolai	-	-
Sukkilam	18	100

11. Envagai Thervu

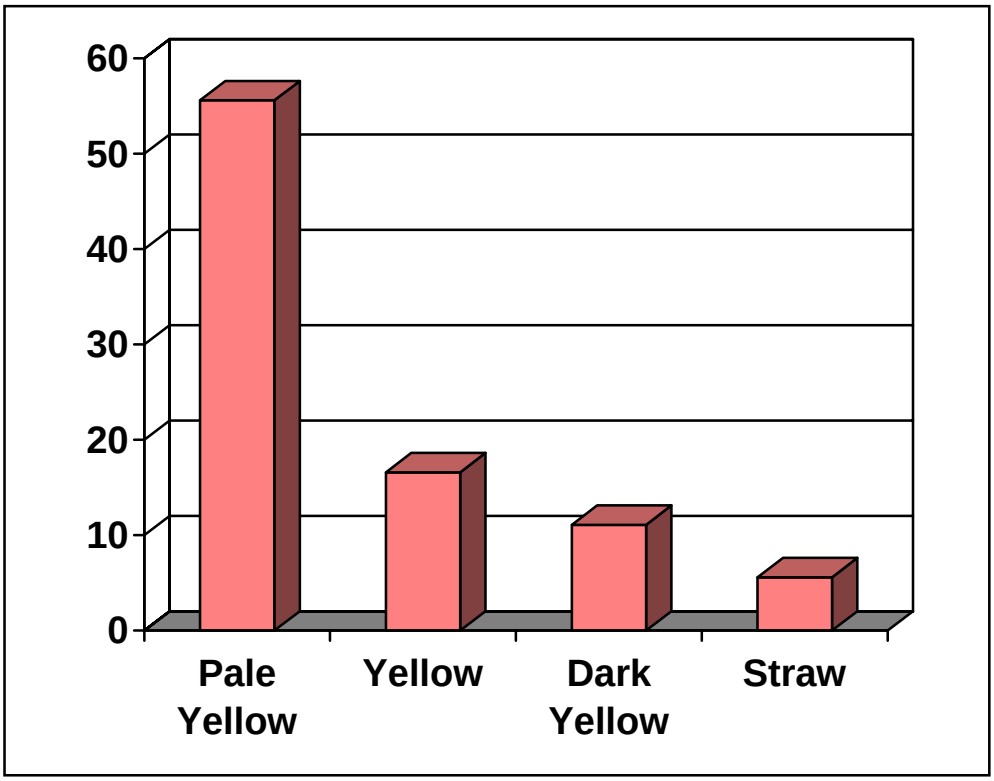
Envagai Thervu	Cases	
	No	Percentage (%)
Naa		
Dryness	4	22.2
Niram		
Vatham	11	61.1
Pitham	6	33.33
Kapham	1	5.6
Mozhi	-	-
Vizhi	-	-
Malam	2	11.1
Moothiram	4	22.2
Sparisam		
Veppam	6	33.33
Thatpam	12	66.66
Naadi		
Vatha pitham	10	55.6
Pithavatham	6	33.33
Vathakapham	2	11.1

12. Buoyancy on water

Buoyancy on water	Cases	
	No	Percentage (%)
Yes	1	5.6
No	17	94.4
Total	18	100

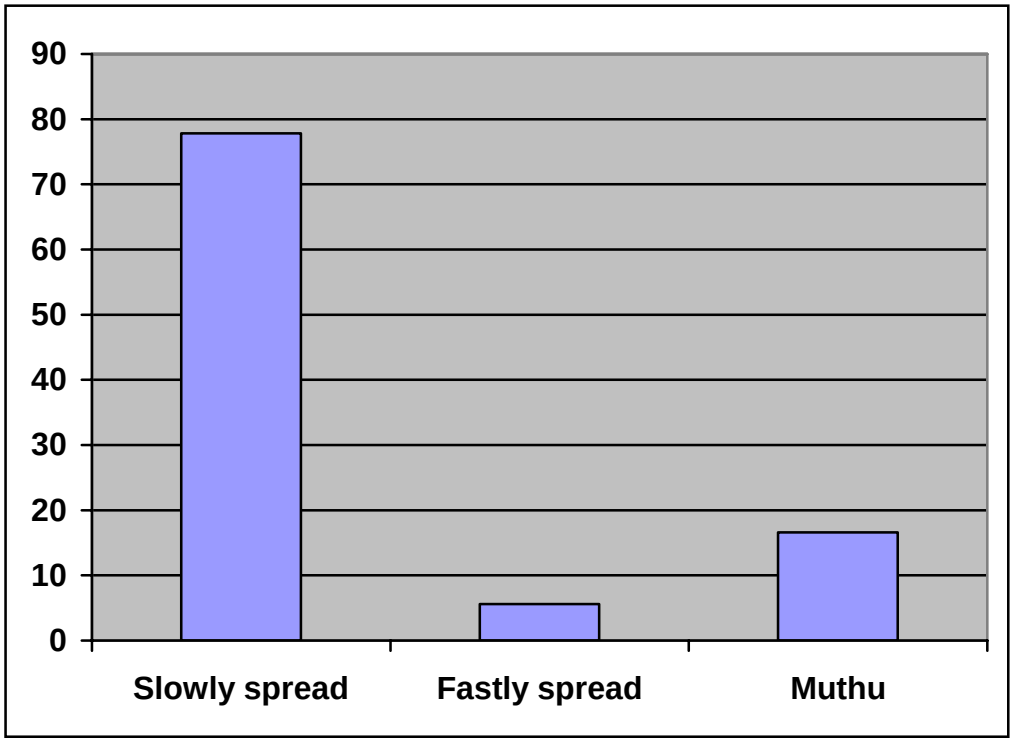
13. Neerkuri

Neerkuri	Cases	
	No	Percentage (%)
Pale Yellow	10	55.6
Yellow	3	16.6
Dark Yellow	2	11.1
Straw	1	5.6
Total	18	100



14. Neikuri

Neikuri	Cases	
	No	Percentage (%)
Slowly spread	14	77.8
Fastly spread	1	5.6
Muthu	3	16.6
Total	18	100



Results of statistical analysis of objective parameters (semen analysis) before and after treatment of 18 patients of Aan maladu

s.no	Parameter	Mean			Statistical Test criterion	Probability Value (p)	Statistical significance of the difference
		B T	AT	difference			
1	Sperm count	16.99	21.32	4.327	t = 2.338	t 0.05=2.131	Significant
2	Sperm motility	719	940	231	t = 2.243	t 0.05=2.131	Significant

Results of statistical analysis of subjective parameters before and after treatment of 18 patients of Aan maladu

s.no	Parameter	Mean			Statistical Test criterion (chi square)	Probability Value (p)	Statistical significance of the difference
		B T	AT	difference			
1	Premature ejaculation	61.11	61.11	0	$X^2 = 9.09$	$X^2 = 3.84$	Significant
2	Nocturnal emission	38.88	38.88	0	$X^2 = 5.14$	$X^2 = 3.84$	Significant
3	Erectile dysfunction	27.77	27.77	0	$X^2 = 3.2$	$X^2 = 3.84$	Not Significant

DISCUSSION

Age Distribution

Out of 18 patients, most of were below 30 yrs. The improvement was same as all the age groups, which I had selected for the study (i.e.) 25 - 45 yrs.

Occupational History

6 patients were working in hot atmosphere. This may be one of the causes for infertility.

Food Habits

All the 18 patients were non - vegetarians. This is more prone for developing infertility.

Personal Habits

One patient was affected by smoking and another one by alcohol & two were affected by tobacco chewing.

History of Masturbation

5 patients affected by the habit of masturbation. Out of these 3 patients were within 5yrs duration and 2 patients were above 5yrs duration. All the 5 patients the frequency of masturbation was once in 2 days or weekly thrice.

Duration of Marriage

Most of the patients were within 3 yrs of duration. Out of these 70% were improved.

Thinai

Most of the patients came from neithal thinai. Commonly Vali is deranged in its state in this thinai. Abana vayu is affected in male infertility patients.

Paruvakaalam

50% of patients came in karkaalam. The body which had already been weak due to the effect of previous season. In karkaalam pitham increases in its state. It may be one of the causes for infertility.

Clinical Features

Pre mature ejaculation is the commonest symptom in infertility patients. Most of the patients came with this. These patients were not fully satisfied during intercourse. All the patients were improved after treatment.

5 patients came with erectile dysfunction, but not persistent. All the 5 were improved after treatment. Sometimes premature ejaculation and erectile dysfunction may be associated with painful coitus.

Nocturnal emission is another important feature in infertility. Recurrent emission leads to decreased sperm count and motility. 7 patients came with this. All the 7 were improved after treatment.

Occasionally painful micturition may be associated with male infertility patients. 4 patients came with this.

Vali

Premature ejaculation, erectile dysfunction, nocturnal emission, painful micturition are due to deranged Abana vayu. 13 patients affected by abana vayu.

Azhal

Sathaga pitham (life energy) was affected in most of the infertility patients.

Iyyam

Tharpagam may be affected in patients those who have working in hot atmosphere.

Udal Thathukkal

Sukkilam affected in all patients. Saarum affected in 13 patients. Senneer affected in 9 patients. Derangement of sukkilam, saarum, senneer or any one of

this lead to development of infertility. Sometimes oon & kozhuppu may be affected.

Envagai Thervu

Niram - 11 patients came with Vatha niram, 6 patients came with pitha niram and only one with kapha niram.

Sparisam - Sparisam was veppam in 6 patients (i.e.) due to working in hot atmosphere.

Moothiram - Moothiram was affected in 4 patients due to painful micturition.

Nadi – Vatha pitham & pithavatham was the commonest nadi in majority of cases.

Buoyancy on water

Only one patient semen floated 15 minutes on water. Others semen did not float on water.

Neerkuri

The colour of the urine was pale yellow in 10 patients, dark yellow in 2 patients. The yellowish colouration is due to pithathontham.

Neikuri

Most of the patients it was slowly spread (i.e.) curable condition.

Statistical analysis

Objective parameters (t test)

The sperm count and sperm motility differences are statistically significant.

Subjective parameters (chi square test)

The premature ejaculation and nocturnal emission differences are statistically significant.

The erectile dysfunction difference is not significant.

SUMMARY

The aim of the study is to increase the sperm count and sperm motility in male infertility patients. The trial medicine, Murungaipoo lehyam was prepared as per the literature. The duration of the trial period is 90 days. The trial dose is 5 gm twice a day. I had selected 18 patients for the trial, based on inclusion and exclusion criterias.

Before treatment Informed consent will be obtained from the patients. Before treatment semen analysis, routine blood and urine examination were taken in all the 18 patients. Siddha methods like udal thathukkal, Envagai thervu, neerkuri, neikuri and buoyancy on water were noted in selection proforma. 13 patients came with clinical symptoms like premature ejaculation, erectile dysfunction, painful micturition, nocturnal emission, painful coitus. Other 5 patients did not felt any clinical symptoms before and after married life. The entire details of the patients were noted in the selection proforma.

They will be instructed to come for next clinic visit after 10 days. Also they will be asked to bring back the unconsumed drug during their next visit and return the same. The assessment form was noted in every clinic visit.

At the end of treatment the clinical symptoms reduced in all the 13 patients. After treatment semen analysis was taken in 16 patients. Out of these 12 patients were improved. 2 patients did not give semen analysis after treatment. But, they were relieved from clinical symptoms. 3 patients attained the stage of fertilization. After treatment no side- effects were noted.

The quantitative analysis of the medicine was done in atomic absorption spectrometer method. The study indicates the presence of minerals like sodium, potassium, zinc, manganese, calcium, iron. The qualitative analysis indicates the presence of phosphorus and sugar. The zinc, manganese, selenium are helpful for the male sexual function. The calcium and phosphorus are helpful for prostatic composition of semen.

CONCLUSION

In clinical trial, out of 18 patients, 12 patients were improved. The sperm count and the sperm motility was increased in those patients. All the 18 patients were relieved from clinical symptoms.

The sperm count and sperm motility differences are statistically significant in Male infertility patients.

Chemical analysis of Murungaipoo lehyam indicates the presence of elements like sodium, calcium, phosphorus, zinc, selenium, manganese, potassium, iron and sugar.

There are no side effects observed during the course of treatment and after treatment also.

The cost of the medicine is comparatively low. The ingredients are easily available and the rural people will be benefited more.

I have concluded the siddha medicine; Murungaipoo lehyam was effective in the treatment of Aan maladu (Male infertility especially Oligospermia and Asthenozoospermia).

MURUNGAIPOO LEHYAM

INGREDIENTS

Murungaipoo (Moringa oleifera) - 2 lt

Liquid drugs

Cow's milk - 1 lt

Milk of coconut - ½ lt

Tender fruit of coconut - 1 lt

Flower juice of coconut - ½ lt

Milk of cottonseed – 1lt

Sugar - 1400 g

Raw drugs Each -17 ½ g

Kasa kasa - Papaver somniferum

Chukku - zingifer officinale

Seeragam - cuminum cyminum

Thetranvidhai - Strychnos potatorum

Val milagu - Piper cubeba

Elarisi - Elatteria cardamom

Sathikkai - Myristica fragrance

Sathipathri - Myristica fragrance

Milagu - piper nigrum

Athimaduram - Glycyrrhiza glabra

Lavangapattai - Cinnamomum verum

Poonaikkali vidhai - Mucuna pruriens

Lavangam - Syzygium aromaticum

Poomisakkarai kizhangu - merma arenaria

Marattimoggu - Spilanthous oleracea

Nilappanai kizhangu - Curculigo orchioides

Honey -100 g

Ghee - 200 g

Method of preparation

Take Murungaipoo along with liquid drugs. Then boil it till the flowers attaining the full boiled consistency. Filter the liquids and add sugar with the filtering fluids. After that boil the fluids up to the consistency of paaku. All the raw drugs are finely powdered and stirr up with the paaku and make it in to lehyam. Finally mix the ghee, and honey as per the requirement.

Dose – 5 g twice a day.

Indications

Improves the spermatogenesis, reduces the heat and nourishes the body.

ÓÕí¨¸ôâ (Flower of Drum stick)

Botanical name - Moringa oleifera

Í¨Å - ¨¸ôÒ, ÐÅ÷ôÒ, þÉ¢ôÒ.

Ì½õ

“Å¢Æ¢ÌÇ¢ÕõÀ¢ò¾õ§À¡õ Å£ÈÕº¢ §ÂÌõ
«Æ¢**Å¢óÐ×õÒ‰Ê** Â¡Ìõ ±Æ¢Ä¡÷
´Õí¨¸Â¸ Ä¡¸¸ü Ò¨¼Å¡ ½¨¸§Â!
ÓÕí¨¸Â¢ý â¨Å ¦Á¡Æ¢”.

Chemical constituents

Traces of alkaloids, quercetin, kaemferol.

¦¾ýÉõâ (Flower of coconut tree)

Botanical name - Cocus nucifera

Í¨Å - ÐÅ÷ôÒ, ¾ý¨Á - ¾ðÀõ, À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“§Á¸õ «¸ì¦¸¡¾¢ôÒ Å£ÚÅ¢ Ãò¾À¢ò¾õ
§Å¸ «º¢÷ì¸Ã§¿¡ö Å£ØÀ¢ÃÁ¢ §¾¸ò¾¢ø
Å¢ýÉõÀ¡Ä¢ìÌõ Å¢¼À¡¸õ §À¡¸¦ÅýÈ¡ø
¦¾ýÉõÀ¡¨Çôâ¨Åò ¾¢ý”.

§¾í¸ ¡öôÀ¡ø (Milk of coconut)

Ì½õ

“Å¡¾Á¡õ À¢ò¾ÓÚõ Åý¸ÃôÀ ÛõÀ¼Õó
¾¡ÐÁ¢¸ Å¢Õò¾¢Â¡ó ¾¡úÌÆ§Ä §À¡¾¿øÄ
«ýÉ Á¢ÈíÌ Á¾¢ÂÕº¢Ôñ¼¡Ìó
¦¾ýÉí¸¡öô À¡Ä¡ü ¦ÈÇ¢”.

ÀÍõÀ¡ø (Cow’s milk)

Ì½õ

“¦¿öÂÕ¸¢ü ¸ñÌÇ¢Õõ ¿£ú**Íì¸¢Ä Óñ¼¡õ**
¦ÅöÂÀº¢ Ôñ¼¡ö Å¢ÎõÀ¢ò¾õ - ¦Á¡öÌÆÄ¡
Ôû¦Åì¨¸ §À¡ìÌ ÓÂ¢¨Ã ¿¢¨Ä¿¢ÚòÐí
¦¸¡û Å¢ò¾ý À¡øÌ½õ’.

Chemical constituents

Albuminoids (casein), fat, sugar, calcium, potassium and magnesium phosphates, sodium

þÇ¿£÷ (Tender fruit of coconut)

Ì½õ

“þÇ¿£Ã¡ø Å¡¾À¢ò¾ §ÁÌ ÁÉÐó
¦¾Ç¢Å¡öò ÐÄíÌÁ¢Õ ¾¢ðÊì ¦¸¡Ç¢Ôí
ÌÇ¢÷îº¢ÔÓñ ¼¡Ìí ¦¸¡ÊÂÅÉ É£íÌó
¾Ç¢÷ò¾¸É ¦¿¡ö¾¡Ìï º¡üÚ”.

Chemical constituents

Potassium, vitamins, reducing sugars.

ÀÕò¾¢ Å¢¨¾

Botanical name – Gossypium herbaceum

Í¨Å - ÐÅ÷ôÒ, þÉ¢ôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - ¸¡÷ôÒ

¦ºö¨¸

¸¡Áõ¦ÀÕì¸¢, ÁÄÁ¢Çì¸¢, §¸¡¨ÆÂ¸üÈ¢.

Chemical constituents

Quercetin, choline, salicylic acid.

¸º¸º¡ (Opium poppy)

§ÅÚ¦ÀÂ÷ - §À¡Šò¾ì¸¡ö

Botanical name - Papaver somniferum

Í¨Å - þÉ¢ôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - þÉ¢ôÒ

Ì½õ

"¸¢ÕÁ¢ ¿¨ÁîºØ ¸¢Ã¡½¢Â¾¢ º¡Ãï

º¢Ã¿£÷ «¿¢ò¾¢¨Ã§À¡ï ¦ºôÀ¢ø - ¯ÕÅÆÌí

¸¡ó¾¢ÔÓñ ¼¡Ìí ¸º¸º¡ Å¢ýÌ½ò¨¾ò

§¾÷ó¾Å÷ìÌ **Å¢óÐ×Á¡ó §¾÷."**

Chemical constituents

Calcium, phospherus, iron, thiamine, nicotinic acid, manganese, zinc,copper, Oxalic acid.

§¾üÈ¡ý (Clearing nut tree)

§ÅÚ¦ÀÂ÷ - þøÄõ, ¸¾¸õ, º¢øÄõ, §¾Ú

Botanical name - Strychnos potatorum

Í¨Å - ¨¸ôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

"Üü¦Èý Ú¨ÃìÌÅ¢Æ¢ì §¸¡ÁÇ§Á! ±ô§À¡Ðõ

°üÈ¡õ À¢ÃÁ¢ÂÓõ ¯ðÒñÏõ ¬üÈÅ¢Ä¡ø

¦Åð¨¼ «¸ì¸ÎôÒõ Å£È¢ ÅÃ¢ü§ÈüÈ¡í

¦¸¡ð¨¼¾¨É ¿£¦ÂÎòÐì ¦¸¡û".

Chemical constituents

Strychnine, brucine novacine

Å¡øÁ¢ÇÌ (Tail pepper)

Botanical name - Piper cubeba

Í¨Å - ¸¡÷ôÒ, Å¢ÚÅ¢ÚôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“Å¡¾À¢ò¾ ³Âõ ÅÂ¢üÚ ÅÄ¢¾¡¸ï
º£¾õ ÀÄ§¿¡ö º¢¨¾Ôí¸¡ñ §À¡¾
«¾¢¾£ÀÉÁ¡õ «½í¸Ã§º! ¿¡Ùó
Ð¾¢Å¡ø Á¢Ç¸Õó¾î ¦º¡ø”.

Chemical constituents

Resinous matter including cubebin, cubebol, cubebic acid, fixed oil,starch, essential oil

²Äõ (Cardamom seeds)

§ÅÚ¦ÀÂ÷ - ¬ïº¢, §¸¡Ãí¸õ, ÐÊ

Botanical name – Elatteria cardamom

Í¨Å - ¸¡÷ôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“¦¾¡ñ¨¼ Å¡ö¸×û ¾¡ÖÌ ¾í¸Ç¢ø
§¾¡ýÚõ §¿¡Â¾¢ º¡ÃõÀý §Á¸ò¾¡ø
¯ñ¨¼ §À¡ø±Øí ¸ðÊ ¸¢Ã¢îºÃõ
¯Æ¨Ä Å¡ó¾¢ º¢Äó¾¢ Å¢„ïÍÃõ
Àñ¨¼ ¦Åì¨¸ Å¢¾¡¸§¿¡ö ¸¡ºÓõ
À¡Øï §º¡Áô À¢½¢**Å¢óÐ ¿ð¼Óõ**
«ñ¨¼ Â£¨ÇÅý À¢ò¾õ þ¨Åì¦¸øÄ¡õ
¬Ä Á¡í¸Áú ²ÄÁÕó¾§¾”.

Chemical constituents

Calcium, phospherus, iron, carbohydrates, protein

º¡¾¢ì¸¡ö (Nut meg)

§ÅÚ¦ÀÂ÷ - ÌÄì¸¡ö

Botanical name - Myristica fragrance

Í¨Å - ÐÅ÷ôÒ, ¸¡÷ôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“¾¡Ð¿ð¼õ §À¾¢ ºÕÅ¡º¢ ÂïºÃ¢Ã §¿¡ö µÐÍÅ¡ º¸¡ºõ ¯ð¸¢Ã¡½¢ §Å§¾¡ ÊÄì¸¡ö ÅÕõÀ¢½¢§À¡õ ²üÈÁÂø À¢ò¾í ÌÄì¸¡ ÂÕóÐÅ÷ìÌì ÜÚ”.

Chemical constituents

Volatile oils, myristicin, myristic acid,starch and pectin.

º¡¾¢ôÀòÃ¢ (Arillus of the nut)

§ÅÚ¦ÀÂ÷ - ÅÍÅ¡º¢

Botanical name - Myristica fragrance

Í¨Å - ÐÅ÷ôÒ, ¸¡÷ôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“º¡¾¢¾Õõ Àò¾¢Ã¢ìÌò ¾¡Àî ÍÃó¾½¢Ôõ µÐ¸¢ýÈ À¢ò¾õ ¯ÂÕí¸¡ñ **¾¡ÐÅ¢÷ò¾¢** Ôñ¼¡í ¸¢Ã¸½¢§Â¡ §¼¡¾ì ¸Æ¢îºÄÚõ Ôñ¼¡í Ì¨È§Â À¸÷”.

¿¢ÄôÀ¨É ¸¢ÆíÌ (Black musale)

§ÅÚ¦ÀÂ÷ - Å¡Ã¡¸¢, Óºä¢, ¾¢ÃÇ¡Ãõ, ¾¢Ã¸¾¡Õ, ¾¢Ã½Ã¡ºý, º¸¢Âõ, ¾¡ÄãÄ¢, ¾¨Äò¾¡Ð, ¿¢ÄÅ¢ØÁ¢, §¿Âõ, ÌÈò¾¢, ºº¢Âõ, º¢ò¾¢

Botanical name - Curculigo orchioides

Í¨Å - þÉ¢ôÒ, ¾ý¨Á - ¾ðÀõ, À¢Ã¢× - þÉ¢ôÒ

Ì½õ

“ §Á¸ ÅÉø¾½¢Ôõ ¦ÅñÌð¼ó ¾¡ýÅ¢ÄÌõ
§À¡¸ Á¢¸×ÓÚõ ¦À¡ü¦¸¡Ê§Â! §À¡¸¡¾
Ý¨Ä§Á ¸í¸§Ç¡Î ÐýÛ¸Õõ ÒûÇ¢Ôõ§À¡ï
º¡Ä ¿¢ÄôÀ¨ÉìÌò ¾¡ý”.

Chemical constituents

Curculicosideβ,curculigol, curculigenin, saponin, phenolic glycosides

â¨Éì¸¡Ä¢ Å¢¨¾ (Common cowitch)

§ÅÚ¦ÀÂ÷ - ¸ñÞ¾¢, Áü¸Ê

Botanical name - Mucuna pruriens

Í¨Å - ÐÅ÷ôÒ, ¾ý¨Á - ¾ðÀõ, À¢Ã¢× - þÉ¢ôÒ

Ì½õ

“¾Ø¾¨Ç¿¡ü Èò§¾¡Î º¡Ã¢Ãò¾ô §À¡ìÌõ
ÀØÐÒÃ¢ ¸¢ýÈ¸Ãô À¡Ûõ «Ø§¾Ìó
¾¡ÄÁ¢¨º **Å¢óÐ×Á¡ï** º¡üÈü ¸Õõâ¨Éì
¸¡Ä¢ Å¢¨¾¨Âì ¸ÆÚ”.

Chemical constituents

Levo dopa,mucunadine,prurienine,mucunine, sitosterol, lecithin

þÄÅí¸õ (Cloves)

§ÅÚ¦ÀÂ÷ - «ïÍ¸õ, ¯ü¸¼õ, ¸ÕÅ¡öì¸Ã¡õÒ, §º¡ºõ, ¾¢ÃÇ¢, ÅÃ¡í¸õ

Botanical name – Syzygium aromaticum

Í¨Å - ¸¡÷ôÒ, Å¢ÚÅ¢ÚôÒ, ¾ý¨Á - ¦ÅôÀõ À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“Íì¸¢Ä¿ð ¼í¸÷½ Ý÷Å¢Âí¸ Ä¡ïºÉó¾¡ð
º¢ì¸øÅ¢¼¡î º÷Å¡ º¢ÂôÀ¢½¢Ô Áì¸¢ìÌð
¼í¸ô â§Å¡Î ¾Ã¢À¼Õó §¾¡ýÈ¢Ä¢ø
Åí¸ôâ §Å¡Î¨ÃòÐ Å¡.

Chemical constituents

Eugenol, eugenyl acetate, caryophylline, farnesol.

þÄÅí¸ôÀð¨¼ (Bark of cinnamom)

§ÅÚ¦ÀÂ÷ - ¸ÕÅ¡ôÀð¨¼

Botanical name – Cinnamomum verum

Í¨Å - ¸¡÷ôÒ, þÉ¢ôÒ, ¾ý¨Á - ¾ðÀõ, À¢Ã¢× - þÉ¢ôÒ

Ì½õ

“¾¡Ð¿ð¼õ §À¾¢ ºÕÅÅ¢„õ ¬¸¢Â§¿¡ö â¾¸¢Ã ¸ïº¢Äó¾¢ô âîº¢Å¢¼ï º¡¾¢Å¢¼õ ¬ðÎÁ¢¨Ãô §À¡ÊÕÁø ¬¸¢Â§¿¡öì Üð¼ÁÈ µðÎÁ¢Ä Åí¸ò ÐÃ¢”.

Chemical constituents

Volatile oil, cinnamomic acid, rennin, tannin, sugar, mannit, starch, mucilage

«¾¢Á¾¢Ãõ (liquorice)

§ÅÚ¦ÀÂ÷ - «¾¢í¸õ, «ðÊÁà¸õ, ÌýÈ¢§Å÷

Botanical name – Glycyrrhiza glabra

Í¨Å - þÉ¢ôÒ, ¾ý¨Á - ¾ðÀõ, À¢Ã¢× - þÉ¢ôÒ

Ì½õ

“¾ò¾¢ÅÕ Å¡¾§º¡ ½¢¾í¸¡ Á¡¨Ä ºÕÅÅ¢¼í ¸¡Á¢Â§¿¡ö **¾¡Ð¿ð¼í** Ìò¾¢ÕÁø ¬º¢Âí¸õ þ¾ú§¿¡ö þóÐ ÌÂôÒÏõ §À¡õ Áà¸¦ÁÉì ÜÚí¸¡§Ä”.

Chemical constituents

Glycyrrhizin, glabrolide,liqueritin

âÁ¢º÷ì¸¨Ãì ¸¢ÆíÌ

Botanical name – Merma arenaria

Ì½õ

“§Á¸ÁÚ ÓûÙÕìÌ ¦Åð¨¼ ÂÉüÈ½¢Ôõ
§À¡Ì§Á ãÄõ Ò¸Äì§¸û À¡Ì¦Á¡Æ¢ô
¦À¡ýÉ¨ÉÂ¡ö âÁ¢º÷ì¸¨Ã ¸¢ÆíÌìÌ
ÅýÉ ×¼ø ÀÕìÌõ Å¡úòÐ”.

ÁÃ¡ðÊ ¦Á¡ìÌ

Botanical name - Spilanthous oleracea

Ì½õ

“Å¢óÐ¸ðÎõ ¿¡îÍÃ¨É §Á×ÚõÀø §¿¡Â¸üÚõ
Åó¾¦ÀÕõ À¡ðÊý ÅÄ¢Â¸üÚõ ÓóÐõ
¾¨ÄÅÄ¢Ôõ §À¾¢¨ÂÔõ º¡ÎÁÃ¡ð Êôâ
¿¢¨Ä¨ÁÂ¢¨É Á¡§¾ ¿¢¸úòÐ”.

Chemical constituents

Spilanthol (iso-butyl amides)

Á¢ÇÌ (Black pepper)

§ÅÚ¦ÀÂ÷ - ¸Ä¢¨É, ¸È¢, ¸¡Âõ, §¸¡Ç¸õ, ¾¢ÃÍ¸ø, Á¢Ã¢Âø, ºÕÁÀó¾õ, ÅûÇ¢ºõ, Á¡ºõ, ÌÚÁ¢ÇÌ, Á¨ÄÂ¡Ç¢

Botanical name – Piper nigrum

Í¨Å - ¨¸ôÒ, ¸¡÷ôÒ, ¾ý¨Á - ¦ÅôÀõ, À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“º£¾ÍÃõ À¡ñÎ º¢§ÄòÁí ¸¢Ã¡½¢ÌýÁõ
Å¡¾õ «Õº¢À¢ò¾õ Á¡ÓÄ §Á¡Ðºó¿¢
Â¡ºÁÀŠ Á¡Ãõ «¼ý§Á¸õ ¸¡ºÁ¢¨Å
¿¡ºí ¸È¢Á¢Ç¸¢É¡ø”.

Chemical constituents

Piperine, nitrogen starch, crude piperine

ºÉÃ¸õ (Cumin seeds)

§ÅÚ¦ÀÂ÷ - «¨º, ºÉÃ¢, ¯ÀÌõÀÀ£ºõ, ¿üºÉÃ¢, Ðò¾º¡õÀÄõ, À¢Ãò¾¢Å¢¸¡, À¢ò¾¿¡º¢É¢, §À¡ºÉÌ§¼¡Ã¢, §Áò¾¢Âõ

Botanical name - Cuminum cyminum

Í¨Å - ¸¡÷ôÒ, þÉ¢ôÒ, ¾ý¨Á - ¾ðÀõ À¢Ã¢× - þÉ¢ôÒ

Ì½õ

"À¢ò¾¦ÁÛõ Áó¾¢Ã¢¨Âô À¢ýÉô ÀÎò¾¢ÂÅý
ºòÐÕ¨Å ÔóÐÈóÐ º¡¾¢òÐ Áò¾¦ÉÛõ
Ã¡º¨ÉÔ Á£¦ÅýÚ ¿ñ¨Àô ÀÄôÀÎò¾¢
§À¡ºÉÌ ¼¡Ã¢¦ºÔõ §À¡÷".

"Å¡Ô¦Å¡Î ¿¡º¢§¿¡ö ÅýÀ¢ò¾ï §ºÃ¡Ð
¸¡Âõ ¦¿¸¢Æ¡Ð ¸ñÌÇ¢Õó àÂÁÄ÷ì
¸¡ÃÇ¸ô ¦ÀñÁÂ¢§Ä! ¨¸¸ñ¼ ¾¢ò¾¨ÉÔï
ºÉÃ¸ò¨¾ ¿£¾¢ÉÓó ¾¢ý".

Chemical constituents

Seed contains 14.5% lipids, including neutral lipids, glycolipids, phospholipids, and 14 flavonoid glycosides.

ÍìÌ (Dried zinger)

§ÅÚ¦ÀÂ÷ - «Õì¸ý, «¾¸õ, ¬÷ò¾Ã¸õ, ¯ÀÌøÄõ, ¯Ä÷ó¾þïº¢, ¸ÎÀò¾¢Ãõ, ¦ºÇÅ÷½õ, ¿ÅÍÚ, ¿¡¸Ãõ, Å¢¼ãÊÂ«Á¢÷¾õ, ÍñÊ, §Å÷ì¦¸¡õÒ

Botanical name - Zingifer officinale

Í¨Å - ¸¡÷ôÒ, ¾ý¨Á - ¦ÅôÀõ À¢Ã¢× - ¸¡÷ôÒ

Ì½õ

“ÍìÌÁ¢¸ò **¾¡ÐÅ¡õ** ¦º¡øÄÃ¢Â ¾£ÀÉÁ¡ Á¢ì¸ÅÕ Á¡Áõ§À¡ ¦ÁøÄ¢ ¿øÄ£÷ ¾ì¸¦¾¡Õ ãìÌ¿£÷ À¡öîºø §À¡õ ãÄ§Ã¡¸ò ¾¢¦É¡Î ¾¡ìÌó ¾¡§¿¡ö §À¡Ìó¾¡ý”.

Chemical constituents

Essential oil which contains sesquiterpene hydrocarbons, sesquiterpene alcohol. The predominant sesquiterpene hydrocarbon is zingiberene.

§¾ý

Í¨Å - þÉ¢ôÒ

Ì½õ

“¬ÔÙ¼ ÛðÊ½Á §Ã¡º¢ Â¸ì¸ÀÓ §ÁÂ ÅÆÌõ ÅÇ÷ó¾¢Îí¸¡ñ àÂ Á¾¢Â ¦ÁÛÅ¾É Á¡¾Ã§º ¿¡Ùõ Ò¾¢Â ¿Úó§¾É¡ü Ò¸ø”.

Chemical constituents

Dextrose, levulose, volatile oils, proteins, mucilage, wax, formic acid.

¦¿ö

Ì½õ

“¦¿öÂ¾É¢ø Ì½§Á¾ýÉ¢ø ¨¿ô¦À¡Î ÌÇ¢÷îº¢ÔÑ¼¡õ ¦ºöÂ¸ñ ÒÕÅõ¦¿üÈ¢ º¢Èó¾¿£ú ÅÄ¢ôÒ§À¡Ì ¦Áö¦ÂøÄ¡í ¸¨ÆÔñ¼¡Ìõ Å¢Æ¢Â¢É¢¦Ä¡Ç¢ ×ñ¼¡Ìõ ¨ÀÂ ¦À¡ó¿¢È§Á Â¡ÌõÀò¾¢Â §¿¡ö¸û §À¡§Á”.

QUANTITATIVE ANALYSIS

AIM:

To determine the minerals in murungaipoo lehyam

Instrument:

Atomic Absorption Spectrometer with air – acetylene.

Apparatus and Equipment:

500 ml glass beakers, hot plate, watch glass, 100 ml standard flask.

Chemicals:

Nitric acid, hydrochloric acid, certified reference standards.

Sample preparation:

Transfer a weighed sample in to a 500 ml beaker. Add 10 ml of 1 + 1 HNO3 and 10 ml of 1+1 HCl and heat on a hot plate until the sample gets dissolved. Cool and filter to remove insoluble material. Transfer sample to 100 ml volumetric flask, adjust volume to 100 ml and mix. Take all precautions to avoid contamination at all stages. Prepare a reagent blank containing same amounts of acids used in the preparation of sample. Aspirate the standards and sample in to AAS instrument as per instrument procedure.

Calculation:

Percentage of the element = A / B x 100

A: Concentration of sample in ppm.

B: Dilution factor.

Reference: APHA 21st edition method.

QUANTITATIVE ANALYSIS

S.No	parameters	Result (%)
1	Zinc	0.001
2	Manganese	0.001
3	Sodium	0.049
4	Iron	0.019
5	Potassium	0.695
6	Calcium as ca	0.374
7	Selenium as se	59.0 mg / kg

SUCCESSIVE EXTRACTION

S.No	parameters	Result (%)
1	Hexane extraction	0.20
2	Chloroform extraction	0.15
3	Methanol extraction	6.81

PHYSICAL PROPERTIES

Loss on drying

5 Gms of material is heated in a hot oven at 40 C° to constant weight. The percentage of loss of weight was calculated.

Determination of ash value

Weigh accurately 2-3 Gms of sample in tarred platinum or silica dish and incinerate at a temperature not exceeding 450 C° until free from carbon, cool and weigh. Calculate the percentage of ash with reference to the air dried drug.

Acid insoluble ash

Boil the ash for 5 minutes with 25 ml of 1: 1 dilute HCl. Collected the insoluble matter in Gooch – crucible on an ash less filter paper, wash with hot water and ignite, cool in a dessicator and weigh. Calculate the percentage of acid insoluble ash with reference to the air dried drug.

Water soluble ash

To the Gooch crucible containing the total ash, add 25 ml of water and boil for 5 minutes. Collect the insoluble matter in a sintered glass crucible or on ash less filter paper. Wash with hot water and ignite in a crucible for 15 minutes at a temperature not exceeding 450 C°. Subtract the weight of the insoluble matter from the weight of the ash; the difference of weight represents the water soluble ash. Calculate the percentage of water-soluble ash with reference to the air dried drug.

Alkalinity of water-soluble ash:

5 Gms converted to ash, boiled with water, filtered. Filtrate was titrated against 0.1N of HCl using phenolphthalein as an indicator.

Alkalinity of water soluble ash = X x of acid / 0.1 x W

X = Titre value.

W = Weight of the material taken.

Alkalinity is given as ml of 0.1N of HCl equated to 1 gm.

PH

5 gm of murungaipoo lehyam is weighed accurately and placed in clear 100 ml beaker. Then 50 ml of distilled water is added to it and dissolved well. Wait for 30 minutes and then apply in to PH meter at standard buffer solution of 4.0, 7.0, and 9.2.

S.No	parameters	Result (%)
1	Loss of drying @ 105˚ c	4.12
2	Ash value	3.60
3	Water soluble	49.8
4	Alkalinity as caco3 in water soluble ash	0.048
5	Acid insoluble ash	0.86
6	pH at 10% aqueous solution	4.50

QUALITATIVE ANALYSIS

S.NO	TEST	OBSERVATION	INFERENCE
1.	**Test for steroid: Libermann-Burchard test** 2 ml of test solution is treated with a minimum quantity of CHCl3 and 3–4 drops of acetic anhydride and one drop of concentrated sulphuric acid.	Blue or green colour is not formed.	Absence of steroids.
2.	**Test for alkaloid:** 2 ml of test solution is treated with acetic acid and then treated with 2 drops of Dragendorff´s reagent.	Red or orange precipitation did not form.	Absence of alkaloids.
3.	**Test for sugar** The extract is treated with weak iodine solution	Blue colour is formed	Presence of sugar

4.	**Test for Terpenoids** 5 ml of each extract is mixed in 2ml of chloroform and concentrated sulphuric acid is carefully added to form a layer	Reddish brown Colour is not formed	Absence of terpenoids
5.	**Test for Amino acid** 2 drops of the extract is placed on a filter paper dried well. After drying, 1% Ninhydrin is sprayed over the same and dried well	Violet colour is not developed.	Indicates the absence of Amino acid.
6.	**Test for phosphorus** The extract is treated with ammonium molybdate and concentrated nitric acid.	Yellow precipitation is formed.	presence of phosphorus.

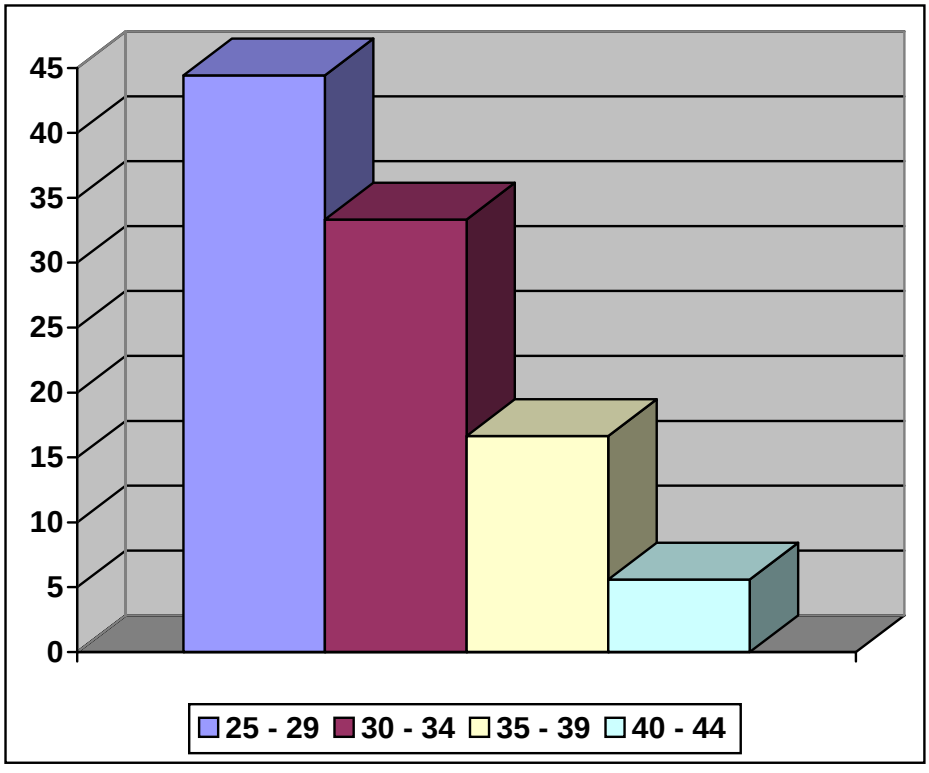
Preparation of the extract:

5 gm of murungaipoo lehyam is weighed accurately and placed in clear 250 ml beaker. Then 50 ml of distilled water is added to it and dissolved well. Then it is boiled well for 10 minutes. Then cooled, filtered in a volumetric flask and then I was made up to 100 ml with distilled water. This fluid was taken for analysis.

OBSERVATION AND RESULTS

1. Age Distribution

Age (Yrs)	Cases	
	No	Percentage (%)
25 - 29	8	44.44
30 - 34	6	33.33
35 - 39	3	16.66
40 - 44	1	5.6
Total	18	100



2. Occupational History

Working in Hot atmosphere	Cases	
	No	Percentage (%)
Yes	6	33.33
No	12	66.66
Total	18	100

3. Food Habits

Food Habits	Cases	
	No	Percentage (%)
Veg.	-	-
Non-Veg	18	100
Total	18	100

4. Habits

Habits	Cases	
	No	Percentage (%)
Smoking	1	5.6
Alcohol	1	5.6
Tobacco Chewing	2	11.1
Total	4	22.3

5. Duration of Marriage

Duration (Yrs)	Cases	
	No	Percentage (%)
0 - 3	10	55.6
4 - 6	5	27.8
7 - 9	1	5.5
10 +	2	11.1
Total	18	100

6. Thinai

Thinai	Cases	
	No	Percentage (%)
Kurunji	-	-
Mullai	-	-
Marutham	2	11.1
Neithal	16	88.9
Palai	-	-
Total	18	100

7. Paruvakalam

Paruvakalam	Cases	
	No	Percentage (%)
Kar	9	50.0
Koothir	-	-
Munpani	4	22.2
Pinpani	2	11.1
Elavenil	-	-
Muthuveni	3	16.6
Total	18	100

8. History of Masturbation

Duration (Yrs)	Cases	
	No	Percentage (%)
0 - 5	3	16.6
6 - 10	2	11.1

9. Clinical Features

Symptoms	Cases	
	No	Percentage (%)
Pre-mature ejaculation	11	61.1
Erectile dysfunction	5	27.8
Painful coitus	2	11.1
Painful micturition	4	22.2
Nocturnal emission	7	38.9
Scrotal Swelling	-	-
No Symptoms	5	27.8

10. Udal Thathukkal

Udal Thathukkal	Cases	
	No	Percentage (%)
Saarum	13	72.2
Senneer	9	50.0
Oon	5	27.8
Kozhuppu	3	16.6
Enbu	-	-
Moolai	-	-
Sukkilam	18	100

11. Envagai Thervu

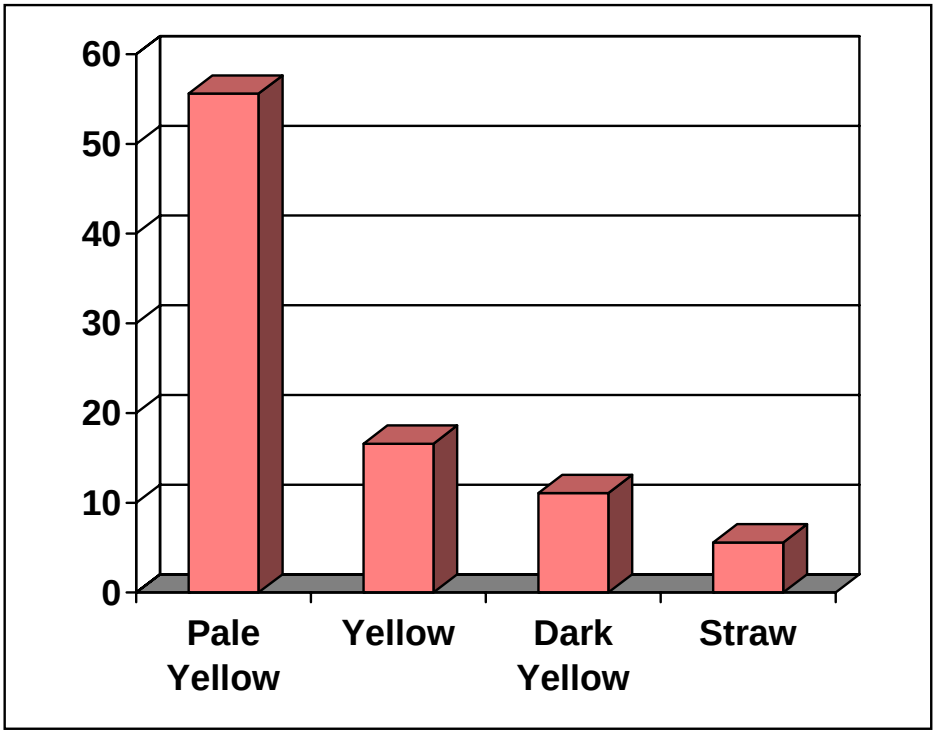
Envagai Thervu	Cases	
	No	**Percentage (%)**
Naa		
Dryness	4	22.2
Niram		
Vatham	11	61.1
Pitham	6	33.33
Kapham	1	5.6
Mozhi	-	-
Vizhi	-	-
Malam	2	11.1
Moothiram	4	22.2
Sparisam		
Veppam	6	33.33
Thatpam	12	66.66
Naadi		
Vatha pitham	10	55.6
Pithavatham	6	33.33
Vathakapham	2	11.1

12. Buoyancy on water

Buoyancy on water	Cases	
	No	**Percentage (%)**
Yes	1	5.6
No	17	94.4
Total	18	100

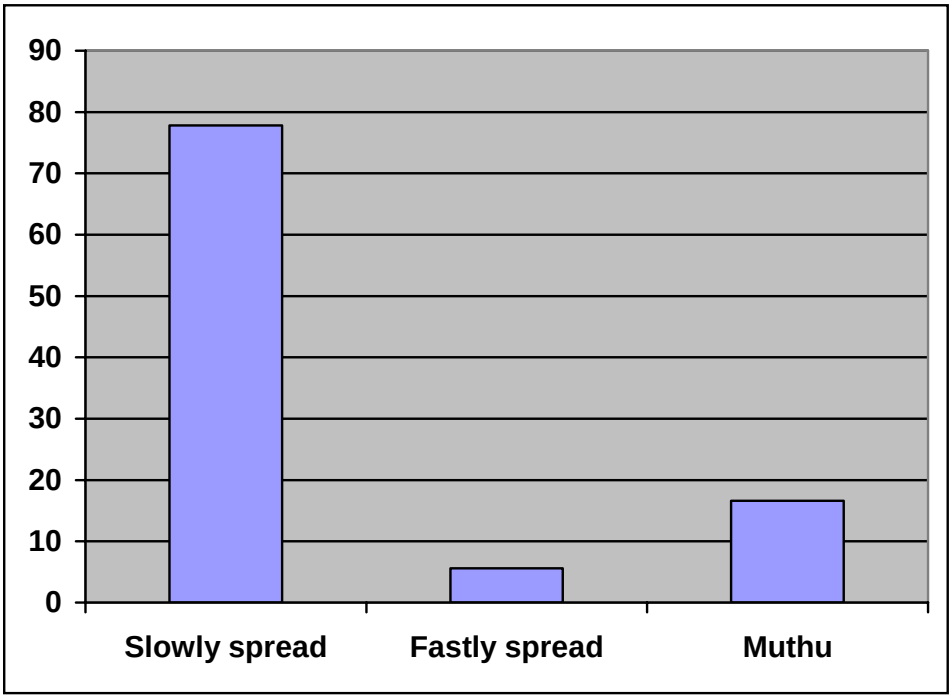
13. Neerkuri

Neerkuri	Cases	
	No	Percentage (%)
Pale Yellow	10	55.6
Yellow	3	16.6
Dark Yellow	2	11.1
Straw	1	5.6
Total	18	100



14. Neikuri

Neikuri	Cases	
	No	Percentage (%)
Slowly spread	14	77.8
Fastly spread	1	5.6
Muthu	3	16.6
Total	18	100



ATHIMADHURAM

BOOMISAKKARAI KIZHANGU

CHUKKU

ELARISI

KASA KASA

LAVANGA PATTAI

LAVANGAM

MARATTI MOGGU

MILAGU

NILAPPANAI KIZHANGU

POONAIKALI VIDHAI

SATHIKKAI

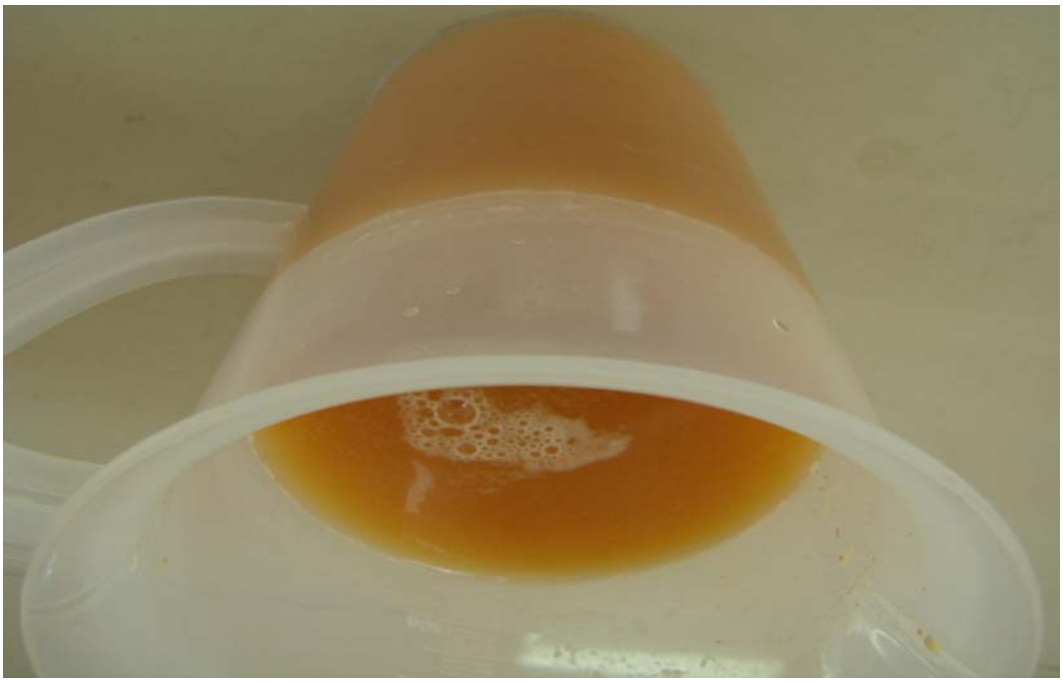
SATHIPATHRI

THETRAN VIDHAI

VAL MILAGU

SEERAGAM

MILK OF COTTON SEED



FLOWER JUICE OF COCONUT

MURUNGAIPOO LEHYAM

Results of statistical analysis of objective parameters (semen analysis) before and after treatment of 18 patients of Aan maladu

s.no	Parameter	Mean			Statistical Test criterion	Probability Value (p)	Statistical significance of the difference
		B T	AT	difference			
1	Sperm count	16.993	21.32	4.327	t = 2.338	t 0.05=2.131	significant
2	Sperm motility	719	940	231	t = 2.243	t 0.05=2.131	significant

Results of statistical analysis of subjective parameters before and after treatment of 18 patients of Aan maladu

s.no	Parameter	Mean			Statistical Test criterion (chi square)	Probability Value (p)	Statistical significance of the difference
		B T	AT	difference			
1	Premature ejaculation	61.1111	38.88		$X^2 = 9.09$	$X^2 = 3.84$	significant
2	Nocturnal emission				$X^2 = 5.14$	$X^2 = 3.84$	Significant
3	Erectile dysfunction				$X^2 = 3.2$	$X^2 = 3.84$	Not Significant